Just for your
TRS-80® COLOR
TDP System 100
Dragon & MC-10

December 1984

Canada $4.95 U.K. £3.35 $3.95

The RAIN OW®

THE COLOR COMPUTER MO LY MAGAZINE

OUR HOLIDAY ISSUE

GREETING CARDS
GRAPHICS
MUSIC
MAILING UTILITIES

128K UPGRADE!

ADVENTURE CONTEST WINNERS!

AND MUCH MORE, INCLUDING MORE THAN THREE DOZEN PRODUCT REVIEWS

For You
G
F
C
D
X
S
W
Z
A
Q
SHIFT

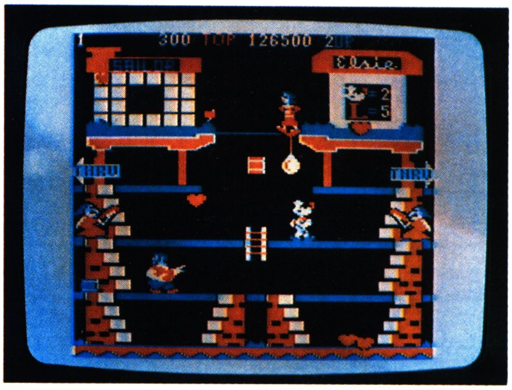
SPECTRUM PROJECTS CATALOG INSIDE

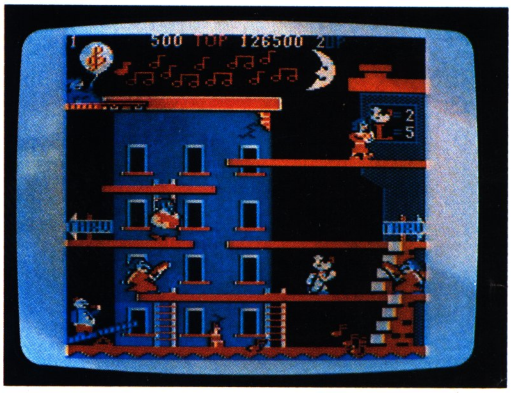
ANNOUNCING!

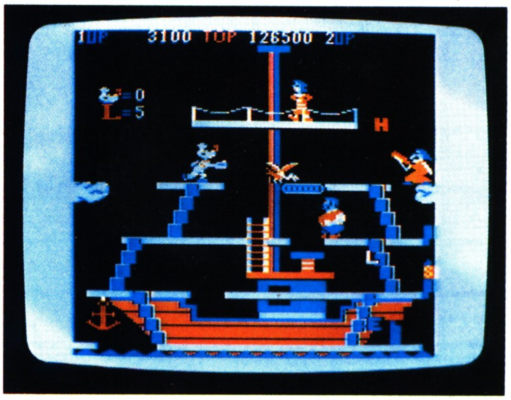
The SAILOR MAN

3 Screens-Plus-"INVISO SCREEN"

The First 64K Arcade Game For the Color Computer







The first screen objective is to catch enough of Elsie's kisses (those Red Heart Shaped Things) to fill in the squares on the Sailorman's house. If you can time your punch just so, you can send the punching bag over to knock the bucket down and, with a little bit of luck, right onto **Bigfatbadguy's** head. This will give you a little (but not much) time to catch all those RHSTs.

You must avoid contact with **Bigfatbadguy** who is actively pursuing you. You must also be careful of **Olduglyseawoman** who will appear at higher difficulty levels to chuck empties at you. Either avoid the flying bottles or punch them (with the fire button) to keep from being knocked into the water.

The second screen objective is to collect enough notes to play Elsie a little love song. You may jump off and onto the other end of **Fatguyeatingahamburger's** teetertotter to fly up a deck and even two decks if you manage to catch hold of **Smartaleckkid's** grab handles. Time it right and away you go.

The Third screen objective is to collect enough letters (thrown by Elsie's cries for H-E-L-P) to complete a ladder all the way to the crow's nest where Elsie is calling you. Beware of the Crow, however, who thinks you are after her eggs!

On all screens, eating a can of **collard greens** (labeled "S" for Collard and grasped by punching the can just right) will give you amazing speed, strength and agility and allow you to send **Bigfatbadguy** into the drink with a single punch.

PLUS...

1. All Machine Code
2. Save Scores Feature
3. Start on any screen
4. Set your own difficulty level
5. Choose the number of men desired

REQUIRES 64K

DISK **$34.95** TAPE **$29.95**

TOM MIX SOFTWARE
4285 BRADFORD N.E.
GRAND RAPIDS, MI 49506
(616)957-0444

•ADD $2.50 POSTAGE & HANDLING•TOP ROYALTIES PAID•
•MICHIGAN RESIDENTS ADD 4% SALES TAX•
LOOKING FOR NEW SOFTWARE

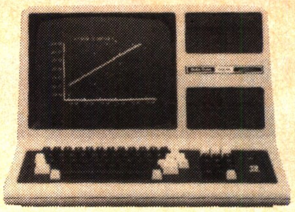
ARCADE ACTION GAMES

From Computer Plus to YOU . . .

PLUS after PLUS after PLUS

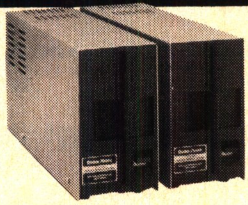
Model 100 8K $495
Model 100 24K $625

Color Computer II
w/16K Ext. Basic $135
w/64K Ext. Basic $195

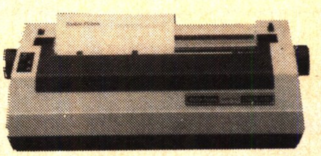


Model 4 16K $629
Model 4 64K
2 Disk & RS232 $1020

DMP120 $385



Color Computer Disk Drive
Drive 0 $289 Drive 1 $220



DWP210 $489
DWP510 $1295

BIG SAVINGS ON A FULL COMPLEMENT OF RADIO SHACK COMPUTER PRODUCTS

COMPUTERS	
Model 4 Portable 64K w/2 Drives	1020
Model 2000 2Dr	2299
Model 12 1 Drive	2360
Model 16B 1Dr 256K	3965
MODEMS	
Hayes Smartmodem II	215
AC-3	125
DC Modem I	89
DC Modem II	160
DC Modem 2212	315
PRINTERS	
Silver Reed EXP500 D.W. Par.	365
Silver Reed EXP550 D.W. Ser.	430
CGP115	159
CGP220 Ink Jet	545
DMP110	299
Gemini 10X	265
Gemini Powertype	345
Panasonic P1091	315
Smith Corona Fastext	190
Prowriter 8510	345
Okidata and Epson	CALL

ETC.	
Disk Drive Controller	139
Extended Basic Kit	39.95
PBH Ser/Par Conv.	69
64K Ram Chips	62.95
Deluxe Keyboard	35.95
HJL Keyboard	79.95
CCR-81 Recorder	52
Deluxe Joystick (each)	35.95
Joysticks (pair)	22
Video Plus (monitor adapter)	24.95
Video Plus IIC	39.95
Amdek Color 1 + Monitor	299
Amdek Video 300 Green	145
Amdek Video 300 Amber	159
Taxan Color 210 Monitor	245
Taxan Green	125
Taxan Amber	129
SOFTWARE	(Tape Version)
The King	26.95
Screen Print (specify printer)	19.95
Buzzard Bait	27.95
World of Flight	29.95
Colorpede	29.95
Juniors Revenge	28.95
Pac Attack	24.95
Block Head	26.95
Lunar Rover Patrol	24.95
Lancer	24.95
Typing Tutor	23.95
Galagon	24.95
Scott Adams Adventures	19.95
Sea Dragon	34.95
Colorcome	49.95
Telewriter 64	49.95
O-Pak (disk)	34.95
Key-264K	39.95
Deft Pascal	79.95
Elite-Calc	59.95
VIP Writer	69.95
VIP Calc	69.95
VIP Terminal	49.95
VIP Database (disk)	59.95
Graphicom	29.95

Order any 2 software pieces listed and take 10% off their listed price. All Radio Shack software 10% off list. Send for complete list.

CALL TOLL FREE
1-800-343-8124

- *LOWEST POSSIBLE PRICES*
- *BEST POSSIBLE WARRANTY*
- *KNOWLEDGEABLE SALES STAFF*
- *TIMELY DELIVERY*
- *SHOPPING CONVENIENCE*

VISA AMERICAN EXPRESS MasterCard

computer plus

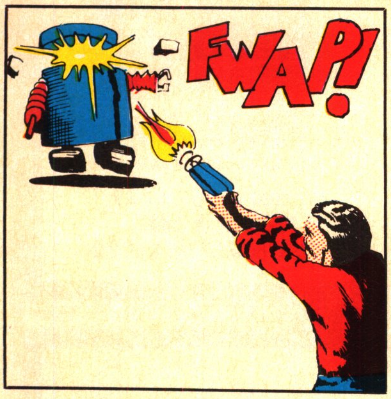
P.O. Box 1094
480 King Street
Littleton, MA 01460

SINCE 1973

IN MASSACHUSETTS CALL (617) 486-3193

TRS-80 is a registered trademark of Tandy Corp.

Under The RAINBOW



66

90

131

FEATURES

Holly Jolly Holidays/*Robert T. Rogers* 18
HOLIDAY MUSIC *Making your holidays festive with music and graphics*

Everything To Know About CoCo/*Andy Kluck* 30
TUTORIAL *New revisions in CoCo's ROM*

The Diskette Directories Handler/*Marvin E. Swan* 37
DISK UTILITY *An easy, efficient diskette file organization*

Christmas Card File And Labeler/*James D. Ball* 42
HOLIDAY HELPER *An aid in preparing Christmas cards*

Season's Greetings/*Joseph Kohn* 60
HOLIDAY GRAPHICS *A holiday message for your family and friends*

The Vote Is In/*Kevin Nickols* 64
ADVENTURE CONTEST REPORT *Announcing the results of our Adventure contest*

Rescue On Alpha II/*Steven C. Mitchell* 66
ADVENTURE CONTEST WINNER *You're a space agent with a deadly mission*

The Head Of The Beast/*Mark Nelson* 90
ADVENTURE CONTEST WINNER *A monster of an Adventure*

CoCo Season's Greeting Cards/*Francis S. Kalinowski* 131
HOLIDAY GRAPHICS *Making beautiful greeting cards*

Cooking With CoCo/*Colin J. Stearman* 154
EXPANDING BASIC *Part VI, a recipe for a parallel printer*

128K The Easy Way!/*Dennis S. Lewandowski* 162
UPGRADE TUTORIAL *Expanding CoCo's memory*

Developing A Database Manager/*Bill Nolan* 256
DISK TUTORIAL *The use of direct access disk files*

NEXT MONTH: January begins a new year and it's the perfect month to be RAINBOW's beginners issue. There will be loads of programs and tutorials for beginners, as well as the more sophisticated CoCo owner. We'll also have our usual colorful mix of columns from the basics to the technical how-to's. The RAINBOW has more games, reviews, educational material, home use programs . . . more information than you can find anywhere about your Color Computer. Look for January's RAINBOW!

STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION
1. Title of publication, Rainbow Magazine. A. ISSN 07464797. 2. Date of filing, September 26, 1984. Frequency of issue, Monthly. A. No. of issues published annually, 12. B. Annual subscription price, $28.00. 4. Location of known office of publication, 9525 U.S. Highway 42, Prospect, Jefferson County, Kentucky, 40059. 5. Location of headquarters or general business offices of the publishers, Same. 6. Names and complete addresses of publisher, editor, and managing editor. Publisher and Editor, Lawrence C. Falk, 9525 U.S. Highway 42, Prospect, Kentucky, 40059. Managing Editor, James E. Reed, 9525 U.S. Highway 42, Prospect, Kentucky, 40059. 7. Owner, Falsoft, Inc., 9525 U.S. Highway 42, Prospect, Kentucky, 40059. 8. Known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages or other securities, None. 9. For completion by nonprofit organizations authorized to mail at special rates (Section 411.3 DMM). The purpose, function and nonprofit status of this organization and the exempt status for Federal Income tax purposes (Check one) Not applicable. 10. Extent and nature of circulation. (X) Average No. copies each issue during preceding 12 months. (Y) Actual No. copies of single issue published nearest to filing date. A. Total No. of copies printed (X)68,608 (Y)79,000 B. Paid circulation 1. Sales through dealers and carriers, street vendors and counter sales (X)23,916 (Y)32,294 2. Mail subscription (X)35,902 (Y)42,965. C. Total paid circulation (X)59,818 (Y)75,259. D. Free distribution by mail, carrier or other means, samples, complimentary, and other free copies (X)1,124 (Y)1,124 E. Total distribution (X)60,942 (Y)76,383 F. Copies not distributed 1. Office use, left over, unaccounted, spoiled after printing (X)1,037 (Y)2,617 2. Returns from news agents (X)6,629 (Y)0. G. Total (X)68,608 (Y)79,000.

COLUMNS

BASIC Training/*Joseph Kolar* 245
Finding a wealth of CoCo knowledge in hints

Bits And Bytes Of BASIC/*Richard White* 124
Rainbow checkbook IV

Building December's Rainbow/*Kevin Nickols* 16
A many-hued preview to this month's issue

Byte Master/*R. Bartly Betts* 249
Introducing Screen 51

Earth To Ed/*Ed Ellers* 172
Beam up those "tech" questions

Education Notes/*Steve Blyn* 174
Gathering information from the CoCo encyclopedia

Education Overview/*Michael Plog, Ph.D.* 265
Are computers producing unrealistic expectations?

Print#-2,/*Lawrence C. Falk* 12
Editor's notes

Turn Of The Screw/*Tony DiStefano* 24
Lights! Camera! CoCo!

Wishing Well/*Fred Scerbo* 107
Football fever, Part II

"Game Master's Apprentice" and "School Is In The Heart Of A Child" will return next month.

RAINBOWTECH

Downloads/*Dan Downard* 268
Answers to your technical questions

KISSable OS-9/*Dale L. Puckett* 271
Closer to UNIX

Personable Pascal/*Daniel A. Eastham* 294
What goes in must come out

hogg-wash/*Frank Hogg* 286
128K and FLEX

"Random Basics" will return next month.

DEPARTMENTS

Advertiser Index 305
Back Issue Information 257
Letters To Rainbow 6
The Pipeline 130
Received And Certified 188
Reviewing Reviews 190
Scoreboard 178
Scoreboard Pointers 180
Submitting Material To Rainbow 158
Subscription Information 196
These Fine Stores 302

PRODUCT REVIEWS

Product Review Contents 185

The RAINBOW

December 1984 Vol. IV No. 5

Editor and Publisher
Lawrence C. Falk

Managing Editor James E. Reed
Senior Editor Courtney Noe
Technical Editor Dan Downard
Copy Editor Susan Remini
Submissions Editor Jutta Kapfhammer
Reviews Editor Monica Dorth
Editorial Assistants Valarie Edwards, Wendy Falk, Debbie Hartley, Suzanne Benish Kurowsky, Lynn Miller Shirley Morgan, Kevin Nickols, Tamara Solley
Technical Assistant Ed Ellers
Contributing Editors Bob Albrecht, R. Bartly Betts Steve Blyn, R. Wayne Day, Tony DiStefano, Dan Eastham, Frank Hogg, Don Inman, Joseph Kolar, Michael Plog, Dale Puckett, Fran Saito, Paul Searby, Fred Scerbo, Richard White
Art Director Sally Gellhaus
Assistant Art Director Jerry McKiernan
Designers Peggy Henry, Neal C. Lauron, Kevin Quiggins
Advertising Coordinator Charlotte Ford
Advertising Representative Kate Tucci
Advertising Assistant Debbie Baxter
(502) 228-4492
General Manager Patricia H. Hirsch
Asst. General Manager for Finance Donna Shuck
Bookkeeper Diane Moore
Advertising Accounts Doris Taylor
Dealer Accounts Judy Quashnock
Administrative Assistant to the Publisher Marianne Booth
RAINBOWfest Site Management Willo Falk
Director of Fulfillment Services Bonnie Shepard
Asst. Customer Service Manager Deidra Henry
Customer Service Representative Sandy Apple
Word Processor Manager Lynda Wilson
RAINBOW ON TAPE Subscriptions Monica Wheat
Research Assistants Laurie Falk, Debbie Leake, Loretta Varda
Dispatch Janice Eastburn
Production Assistant Melba Smith

For RAINBOW Advertising and Marketing Office information, see Page 305

THE RAINBOW is published every month of the year by FALSOFT, Inc., 9529 U.S. Highway 42, P.O. Box 385, Prospect, KY, 40059. Phone (502) 228-4492. THE RAINBOW and THE RAINBOW logotypes are ® trademarks of FALSOFT, Inc.

Second class postage paid Prospect, KY and additional offices. USPS N. 705-050 (ISSN No. 0746-4797). POSTMASTER: Send address changes to THE RAINBOW, P.O. Box 385, Prospect, KY 40059. Forwarding Postage Guaranteed. Authorized as second class postage paid from Hamilton, Ontario by Canada Post, Ottawa, Ontario, Canada.

Entire contents © by FALSOFT, Inc., 1984. THE RAINBOW is intended for the private use and pleasure of its subscribers and purchasers and reproduction by any means is prohibited. Use of information herein is for the single end use of purchasers and any other use is expressly prohibited. All programs herein are distributed in an "as is" basis, without warranty of any kind whatsoever.

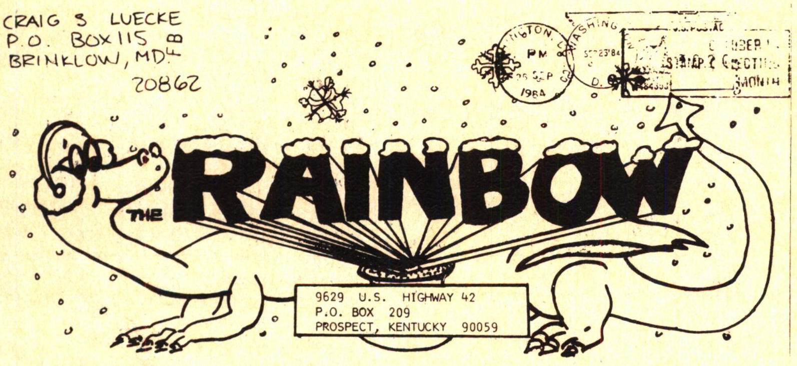
TRS-80, Color BASIC, Extended Color BASIC, Scripsit and Program Pak are ® trademarks of the Tandy Corp. CompuServe is a ® trademark of CompuServe Inc.

Subscriptions to THE RAINBOW are $28 per year ($31 after Jan. 1, 1985) in the United States. Canadian and Mexican rates are U.S. $35 ($38 after Jan. 1, 1985). Surface mail to other countries is U.S. $65 ($68 after Jan. 1, 1985), air mail U.S. $100 ($103 after Jan. 1, 1985). All subscriptions begin with next available issue.

Limited back issues are available. Please see notice for issues which are in print and costs. Payment accepted by VISA, MasterCard, American Express, Cash, Check or Money Order in U.S. currency only.

LETTERS TO THE RAINBOW

ARTS AND LETTERS



Craig S. Luecke
Brinklow, MD

Envelope Of The Month

Editor's Note: Please see the "one-liners" sprinkled throughout this issue of THE RAINBOW. Submit your favorite one-liner too.

HINTS AND TIPS

KEY BEEP.

Editor:

I would like to submit this little piece of information I have learned from one of my pals. It produces a small beep every time you press a key, so that you can be sure that the computer printed the letter on the screen when you pressed the button.

```
POKE 1536,52:POKE 1537,86:POKE
1538,198:POKE 1539,1:POKE 1540,134:
POKE 1541,4:POKE 1542,61:POKE
1543,253:POKE 1544,0:POKE 1545,141:
POKE 1546,189:POKE 1547,169:POKE
1548,86:POKE 1549,53:POKE 1550,86:
POKE 1551,57:POKE 360,6:POKE 361,0
```

Marc Labbe
Biddeford, ME

Better Than Aspirin

Editor:

I have discovered a simple way to defeat the head banger bug in Disk BASIC.

1) Turn the computer on, but not the disk drive.

2) Type DIR.

3) Wait approximately 4.5 seconds after you hit ENTER and press Reset.

4) Turn the disk drive on.

This trick will increase the life of your disk drive.

Eric Odell
Maplewood, MN

Editor:

Richard Gains' hint (September RAINBOW, Page 106) checks whether your printer is on or off line. If I could remember to check before I'm all loaded to print, there would be no problem. Ever since I saw something like the following in a program of Jorge Mir's, I've been wedging this into any applicable program. I can turn on the printer and still have some switch off, so what looks like repetition *is*. It keeps throwing back "not ready" until the printer really is ready.

```
IFPEEK (65314)/2 < > INT (PEEK
(65314)/2) THEN PRINT "PRINTER
NOT READY!":INPUT"WHEN
READY, PRESS (ENTER)";PR $
IFPEEK (65314)/2 < > INT (PEEK
(65314)/2) THEN 1
```

Justin Snyder
Deerfield, IL

Stepping Up

Editor:

If your readers have a Radio Shack disk controller and drive, they can poke two addresses to change the stepping rate after they've entered memory map 1 (64K RAM). *POKES 55232,2* and *55318,22* will change the stepping rate to 20 ms. The benefits are really noticeable with disk intensive programs like *Disk Graphics.*

Thomas P. Reitzel
Perrysburg, OH

Editor:

I would like to share with your readers the following discoveries I have made of *Elite Word* (Disk BASIC) and *Elite File.*

1) To change the *Elite File* top margin (TM) default to zero, so output file can be merged with *Elite Word,* add the following line in the BASIC driver *(FILE.BAS)*:

```
142 POKE &H1D51,&H0
```

2) *Elite Word* generated *&H6* for printer form feed. For most printers, such as OKIDATA 82A, the form feed ASCII code is &HC. To solve this incompatibility problem, add the following lines in the BASIC driver *(EW64.BAS)*:

```
231 POKE &H6072,&H0C
232 POKE &H6959,&H0C
```

Tien Peng
Sudbury, MA

Editor:

Something I discovered while writing a program that sorts by a string of numbers embedded in the front of each information string. The function *"STR$(numeric)"*, which converts numeric expression to a string also adds a space *(ASCII 32)* in front of the string. To eliminate the space I used this line:

```
N$=STR$(X):N$=RIGHT$(N$,1)
```

I only needed one number in this portion of my program, but if X was to be varying lengths then *"LEN$(str)"* could be used in *"RIGHT$"*:

```
N$=RIGHT$(N$,(LEN(N$)-1))
```

works fine. I hope this little tidbit will help someone in their programming.

Andrew L. Cazier
Seattle, WA

Putting On The Switch

Editor:

While at RAINBOWfest I purchased a copy of *GRAPHICOM*. While reading through the documentation for this fine piece of graphics software I had an idea on how to get around the problem of holding down two fire buttons on your joysticks and at the same time moving the cursor around the screen. Radio Shack has a switch (part number 275-617) that is identical to the fire button but is a SPST Push On/Push Off switch. This could be soldered into the joystick in place of the existing fire buttons or any mini SPST Push On/Push Off switch could be mounted into the case of the joystick. This would solve the problem of needing three hands to operate this particular piece of software.

Herman S. Smith
Olean, NY

PEN PAL PLEASE

Editor:

I would like to have a pen pal in the Arizona area. So far I have only found one.

If anyone is interested, please write to: 8113 E. Whitton Ave., 85251.

Chuck Kiefer
Scottsdale, AZ

INFORMATION PLEASE

Editor,

I would like to know if anyone sells the game *Ultima I, II* or *III* for the CoCo 2 with 64K. It doesn't matter whether it's 64K or 32K. Write me at 16 Church Street, 12834.

Geordie Davidsen
Greenwich, NY

Editor:

I own a Tom Mix *Worlds of Flight* simulator. After numerous attempts to land, I still am unable to accomplish this task.

I seem unable to line up with the right speed, altitude and position from the runway to make a landing.

If anyone can give me some hints on how to accomplish a landing, I would certainly appreciate it.

Randolph G. Kyburz
Amarillo, TX

Scoping Horoscopes

Editor:

I am writing in regards to finding a program for horoscopes or numerology. The only one I have found is for the Model I or III. Could you please see if you can find it in your old RAINBOWS?

I love the way RAINBOW is put together and hope it goes on forever. Many thanks. Please write to me at 1513 Princeton Dr. 44212.

Robert E. Morcus
Brunswick, OH

Editor:

We recently received a TDD (telecommunications device for the deaf) for my stepson and I would like to hook this up through my TRS-80 Color Computer 2 so that a preset-up message might be transmitted through the TDD at a quicker speed than he is capable of typing on the TDD keyboard. I realize that this could be done through a recorder; however, this would not affect the speed as it would still play through at the same speed as it was typed.

The programming is not the problem but it is in hardware hook-up, and I thought one of the readers might have solved the same or similar problem. The TDD is a Minicom II manufactured by Ultratec.

If you have any answers, please write me at 1491 Old Kings Road, 32017.

Jim Fitzgivens
Holly Hill, FL

Editor:

I have a few questions you may be able to answer. I just finished typing in a utility I found in your February 1984 issue (Page 188) and it doesn't seem to work. No errors were found and I checked over my listing very carefully, (I list them to my printer). However, the program always seems to lock up. I had to use the start location of 3F00 as the assembler would not take it on my 32K piggyback CoCo. Is that why it locks up; because I have a piggyback system?

Steven Spice
Toronto, Ontario

Editor's Note: That is the only thing I would suspect. Try installing 64K RAMs.

Editor:

I have a Model 33 Teletype and I've built the interface from an article in the February 1983 issue [Page 118] of THE RAINBOW, but, after months of hacking with it, I haven't been able to get the teletype to respond as a printer.

Among the questions that come to mind are:

1) How do I check whether the TTY is running with a .020 or .060 Amp loop? (I measured .063 Amps across terminals No. 2 and No. 8 on SMD card.)

PROFESSIONAL,
EDUCATIONAL,
& BUSINESS
APPLICATIONS SOFTWARE
for the COLOR COMPUTER
RAINBOW CERTIFICATION SEAL

PROFESSIONAL
3-D PLOTTER
Plots any function or a data set
32K $24.95

SPECTRUM ANALYZER
Mach. Language FAST Fourier Transform
32K $24.95

PROPRIETOR'S ACCOUNTANT
NEW!
Complete Bookkeeping System
Screen or Printer Output
Double-entry General Ledger and Journal
Trial Balance, Profit/Loss, Balance Sheet
Keep YOUR expenses DOWN!
32K DISK ONLY
$29.95

MATHEMATICS
16K
MATRIX MATH (Inverse, Determinant) $12.95
EQUATION EVALUATOR (Polynomials, Linear Sets) $12.95
FUNCTION FINDER (Interpolation, Regression) $12.95
CALCULUS (Differentiation, Integration) $12.95
All 4 MATH Programs $44.00

EDUCATIONAL SIMULATIONS
32K
STRATEGY POLITICS $16.95
STRATEGY INVESTING $16.95
IMAGE PROCESSING $16.95
STRATEGY FOOTBALL $16.95
STRATEGY BOXING $12.95
All 5 SIMULATIONS $69.95

Send CHECK or MONEY ORDER
Specify DISK or TAPE Ext. BASIC Req.
Add $2.00 Shipping / Handling
Florida Residents add 5% Sales Tax

Write for FREE CATALOG
ANKIA
RESEARCH
901-19 INDIANTOWN RD.
SUITE R
JUPITER, FL 33458

2) At what point on the SMD card should the connections be made?

Frank J. Chiacchio
Bensalem, PA

Editor's Note: I had a Model 35 so the SMD card was probably different. I think the Model 33 already has a built-in loop supply so just the 4N33 is necessary. Key the loop with the switching transistor in the 4N33. Sorry I can't be more specific but I don't have a Model 33.

Checkers And Chess

Editor:

I recently bought a TRS-80 CoCo 2 with Extended BASIC and I don't know how to make programs. I would like to get a program list for a checker game and also a chess game. If anyone knows of such a game, please let me know so I can order them.

I would like to add that RAINBOW is the best magazine I have read for the CoCo owner. My address is 742 Davis Street, 27288.

Michael Rodgers
Eden, NC

Editor:

Has anyone heard of where I can get a replacement ribbon for my Impact Data printer? It's a very obscure brand of printer, and it requires a three-foot loop of ribbon ¼" wide. I have checked inside a DMP-110 ribbon cartridge and it was much too short. Do any of the other Radio Shack printers have a longer ribbon?

You have had RAINBOWfests all over the country . . . except here up north. When is RAINBOWfest Minneapolis/St. Paul coming up?

Rogers George IV
Terrace, MN

Editor:

I would like to ask two questions.

1) Are there any companies that make RAM expansions for the MC-10 to increase it above 20K? If so, I would like their names.

2) Are there any companies that provide small business software which is adaptable to the MC-10?

Write to me at 135-2 S. Highland Avenue, Apt. B-4, 10562.

Don Joyce, Jr.
Ossining, NY

NOT 1, 2, 3

Editor:

A note to authors — *never use GOTO* or *GOSUB* remark statements. *Never* sequentially number in increments of one. (That just shows that you know how to use the renumber command.)

Always number in increments of 10 starting with Line 100. *Always* insert remark statements as oddball numbers between a standard increment. I don't think I have to explain why, but I will anyway. The gap between 10 and 100 will leave me room for my own header. Have you ever tried to remove remark statements only to find that you had to scan the whole program for references? The increment of at least 10 allows for easy modification. Be nice, don't mess up an otherwise good code.

Paul Eriksen
Newark, DE

BOUQUETS

Editor:

You and your staff are to be complimented for the effort associated with the Princeton RAINBOWfest. The hotel and site selections were excellent and the vendors provided a wide choice of products.

Please continue to foster the theme of quality vendors. It serves all of us in the long term.

C.R. Hering
Doylestown, PA

Editor:

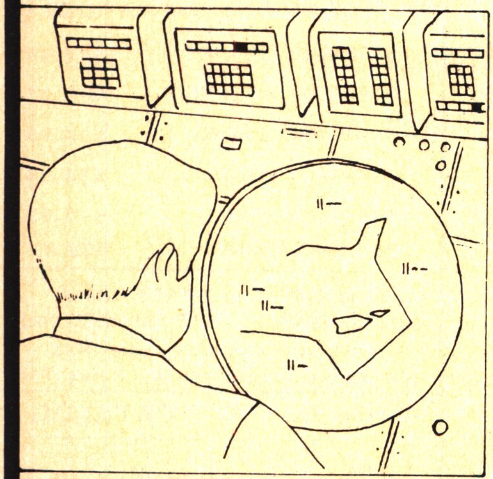
I would like to say a few kind words about one of your advertisers. In July I ordered a Gemini-10X printer from Dayton Associates, Inc., and was pleasantly surprised by their prompt and courteous service. I ordered the printer C.O.D. by phone on Monday and received it the following Friday. I would not hesitate to order any product from them again. Thanks Dayton, I am enjoying my printer.

It's Here!

REALISTIC, FULL-FEATURED . . .

NEW

AIR TRAFFIC CONTROL SIMULATOR



Face the Challenge — Develop the Skills for Air Traffic Control (ATC).
Combines Approach, Departure, Enroute and Tower Control.

- 100% machine language.
- Dramatically exploits the CoCo's processing capability.
- Simulates 40 mile x 10,000 ft. surveillance volume.
- Realistic radar presentation displays airborne and surface traffic.
- Pilot-to-Tower/Tower-to-Pilot communications.
- Develops ATC skills (e.g. traffic separation, approach/departure vectoring, sequencing, and tower procedures).
- Randomly portrays light and high performance aircraft in both visual (VFR) and instrument (IFR) situations.
- Effects of simulated local weather conditions incorporated.
- Scoring system provides feedback on controller performance.
- Three levels of difficulty (traffic density).
- Controller must respond to both visual and sound cues.
- Comprehensive manual includes tutorial on Principles of Air Traffic Control.
- Quick reference card included.

Will Challenge, Entertain and Impress CoCo Users, Simulation Hobbyists and Aviation Enthusiasts.

32K Required
Tape $34.95 Disk $37.95

- No delay for personal checks.
- Money Orders welcome.
- Please add $2.00 postage & handling.
- COD's additional $2.00.
- N.Y.S. residents add sales tax.

BETASOFT SYSTEMS
P.O. Box 1174
Smithtown, New York 11787
(516) 666-7240
Dealer Inquiries Invited

Color Power II™

Gives Your Co Co the Power of

CP/M®

Color Power II is the CP/M computer which plugs into your Color Computer and marries its powerful Z-80A microprocessor with the outstanding 6809E microprocessor to allow you to run thousands of business programs including WordStar,® dBase II,® and SuperCalc II.™

Color Power II includes the CP/M 2.2 operating system and generates a high quality 80 column by 24 line display on your 80 column monitor with upper and lower case letters.

Many are developing hardware and software for use with **Color Power II.**

Double Density Software provides ULTRA TERM +, a communications program, and DOUBLE DOS II, an 80 column generator for Co Co basic. Morton Bay Software provides DOUBLE DRIVER, a monitor driver.

PRICES:

COLOR POWER II	$329.00
ULTRA TERM +	$ 56.00
DOUBLE DOS II	$ 40.00
DOUBLE DRIVER or MONO II	$ 25.00

Call us or one of our dealers or send check, Visa or MasterCard number with expiration date. N.J. residents add 6% sales tax.

CPU **Color Power Unlimited, Inc.**

1260 Springfield Ave., P.O. Box 606-F, New Providence, N.J. 07974 **(201) 665-9646**

DEALERS

Double Density Software
620 Kings Row
Denton, Texas 76201
817-566-2004

Morton Bay Software
316 Castillo Street
Santa Barbara, CA 93101
805-962-3127

DSL Computer Products, Inc.
P.O. Box 1176
Dearborn, Michigan 48121
313-582-8930

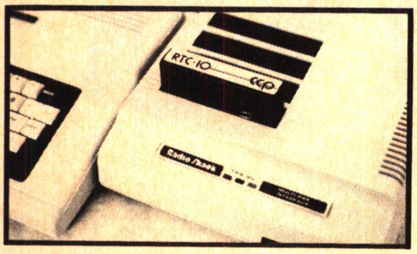
Micro R.G.S. Inc.
759 Victoria Square
Montreal H2Y 2J
800-361-5155

CP/M is a trademark of Digital Research, Inc. WordStar is a trademark of Micropro International Corp.
dBase II is a trademark of Ashton-Tate. SuperCalc II is a trademark of Sorcim Corporation.

REAL TIME CLOCK

RTC-10

Full featured, yet very easy to use. RTC-10 is a quartz-based, Time/Date clock contained in a compact ROM case. RTC-10 makes it simple to access the time and date with just a few Basic PEEKS. A 2-year + replaceable battery (included) keeps time accurate when the computer is off and even when the cartridge is unplugged.



ONLY $89.00

Compatible with any 16K or greater, Extended or non-extended Color Computer, RTC-10 may be used with or without a Radio Shack or any other Multi-Slot unit. To use it with a disk, without a Multi-Slot, order the Y-cable below.

Completely assembled, tested and ready to plug-in and use, with programs included for clock setting and for continuosly displaying the Time/Date in the upper right corner of the video screen. ONLY.................. $89.00

COCO CABLES

Top quality cable and connectors with all gold plated contacts...............

Y-CABLE- 40 conductor, 1 ft. long, 1 Male, 2 Females. Allows you to connect your disk controller pack and the RTC-10 Clock or most voice synthesizers, etc.
ONLY $29.95

DISK PACK EXTENDER CABLE- 40 Conducter, 2 ft. long, 1 Male, 1 Female. Lets you place your disk controller pack where you want it, out of your way.
ONLY $22.95

CUSTOM FLAT CABLES- Call-in or send us your requirement. We will quote a reasonable price for the cable you need.

Custom Computer Products
6 Dogwood Court
Goshen, NY 10924
(914) 469-9780

ccp

ADD $3.00 PER ORDER FOR SHIPPING & HANDLING
FOR C.O.D., INCLUDE AN ADDITIONAL $3.00
NY RESIDENTS MUST INCLUDE SALES TAX.

I would also like to thank Star Micronics, Inc. for the nice "thank you" gift that they sent to me for purchasing their product. It was unexpected and greatly appreciated. Star Micronics, Inc. makes a fine product and they seem to appreciate their customers. In a world that seems to be getting away from personal service, it is refreshing to deal with people who believe in giving you what you pay for.

Thank you RAINBOW for a fine publication and for giving me the opportunity to publicly thank these two fine companies. Keep up the good work.

Barry Rottinger
Crowley, TX

Editor:

I would like to compliment the makers or inventors of *Telewriter 64* software. It's the best I have ever used.

Paul Elias
Chicago, IL

Editor's Note: Cognitec, 704 Nob Street, Del Mar, Calif. can take the credit for that software.

Editor:

Sometimes I read and write letters describing horrible experiences with computer dealers. I thought your readers would like to know of the wonderful service I've had from one of your advertisers, Computerware of Encinitas, Calif.

I ordered one of their green screen monitors, tried it, but found that in the Hi-Res mode it had a little too much contrast for my liking. After a couple of weeks, I exchanged it for an amber monitor, thinking that would make things better, but I still had the same problem. Eventually I had to return the monitor for a refund, which was promptly issued.

The point here is not that the monitor was not to my liking, but that Computerware stood behind their guarantees 100 percent, the people I dealt with were always helpful; a genuine effort was made to get my system working the way I wanted, and I was never given an argument.

Duff Kennedy
Santa Barbara, CA

A CLUB

Editor:

I am writing to you with details of a new national user group for the Dragon/Tandy computer, based in Europe. As I am sure you are aware, Dragon Data, the company that made and sold the Dragon, has ceased to exist. However, things are far from gloomy for Dragon users.

First of all, the Dragon Computer will continue to be made (in Spain) by a company called Eurohard, who will also be responsible for worldwide distribution. United Kingdom sales, distribution and servicing will be handled by GEC and a new company has been formed (from the ashes of Dragon Data) called "Touchmaster," that will be responsible for customer support and software development.

A new national users club has been set up to replace that previously run by Dragon Data. It has the official backing of "Touchmaster" ex-Dragon Data. Our main aim is to get the 6809 better publicity in the computer press and to provide a forum for exchange of ideas, etc. I would be grateful if you would publish details of this new club, further information available on request. Write to: North Down Microcomputer Users Club, 1 Meadowvale Crescent, Bangor, County Down, BT19 1 HQ, Northern Ireland.

I have been a reader of THE RAINBOW since December 1982, it's the best. Keep up the good work.

E.S. Doak
Bangor, Northern Ireland

KUDOS

Editor:

Do you ever get tired of hearing how great your magazine is? Probably not! And I definitely never get tired of reading and rereading each and every issue. I was lucky enough to get copies of those first photocopied issues, and now have a complete collection of THE RAINBOW to date.

Ron Rogers
Christiansburg, VA

Editor:

I continue to enjoy THE RAINBOW each month. The current series on *Cooking With CoCo* by Colin Stearman is particularly interesting and promises to be one of the most useful things you have done.

Robert H. Severin
Oak Ridge, TN

Prose From A Pro

The Rainbow
Is full of info.
It is not a degenerate,
So I don't fret.

To await the 300 plus page sum,
Causes myself great delirium.
With the contributing pros,
It's the only way to go.

From education overviews,
To software reviews,
Maybe a three year index,
Or a lesson in Hex.

A little turn of a screw,
Just to name a few.
You're doing swell,
And I wish you well.

I am 15 years old, and of course, your magazine is the best on the lot. The scratch and sniff game was a great idea.

Grant L. Hutchison
Thamesford, Ontario

Editor's Note: The scratch and sniff game appeared in the July 1984 issue, Page 90 — Our Third Anniversary issue.

For TRS-80 Color Computers

NEW!

Children's Tales

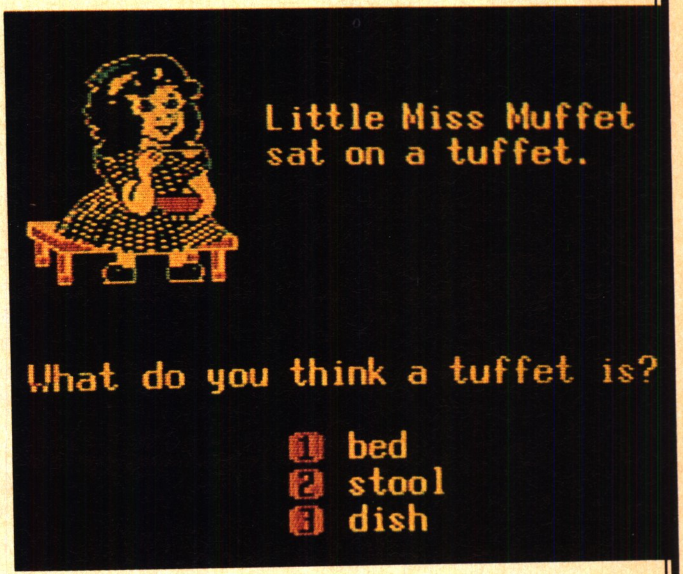
An Interactive Reading Skills Educational Tutorial

GREAT GIFT FOR CHRISTMAS!

Children, ages 4-11

can experience the centuries-old enjoyment of fairy tales and nursery rhymes with the magic of today's technology now with this new Dorsett Talk/Tutor reading skills program. Mother Goose, Aesop's Fables, The Great Pyramids. These and many other favorite stories are brought to life in full color for the education and entertainment of your children. Easy words and colorful, high-resolution visual effects combine with professional narration to hold your children's interest while eliciting frequent participation. Most responses are multiple-choice, although there may be occasional opportunities for typed responses, with the option for by-pass. Remedial first-order branching is also available. It's all designed to give your children hours of entertainment while they enjoy learning new reading skills. Call our toll free number to order today.

There are 8 cassettes in this **16-program series**. One cassette has a half-hour program on each side. The cost is **$8.80** per cassette. **The complete 16-program series is only $59.90.**



```
Little Miss Muffet
sat on a tuffet.

What do you think a tuffet is?

1 bed
2 stool
3 dish
```

Sample frame from Children's Tales, a reading skills series

CHILDREN'S TALES READING SKILLS SERIES

CT 1	Mother Goose—"Hey Diddle, Diddle," "Jack and Jill," and other rhymes make using the computer fun while we learn; **for ages 4-7.**
CT 2	More Mother Goose—"Little Boy Blue," "Little Miss Muffet," and other rhymes give us more enjoyment while we learn; **for ages 4-7.**
CT 3	The Three Little Kittens—"had lost their mittens..." and we have more fun while we find them; **for ages 4-7.**
CT 4	The Three Bears—"Great Big Bear, Middle-sized Bear, and Wee Little Bear" find a surprise in their house when they come home; **for ages 4-7.**
CT 5	Aesop's Fables—Aesop was a slave who lived in Greece and told wonderful stories; "The Country Mouse and the City Mouse," "The Tortoise and the Hare," and others; **for ages 4-7.**
CT 6	A Child's Garden of Verses—Robert Louis Stevenson wrote a number of cherished rhymes; "The Land of Nod," and others; **for ages 4-7.**
CT 7	Cinderella—Poor Cinderella is treated like a slave by her step-mother and step-sisters, until she meets her Fairy Godmother; **for ages 6-9.**
CT 8	Alice in Wonderland—A modern adaptation of Lewis Carroll's "Adventures of Alice," where Alice goes shopping with her father and has some incredible experiences; **for ages 6-9.**
CT 9	The Emperor's New Clothes—The Emperor has some very unusual clothes which everyone would like to see; **for ages 6-9.**
CT 10	The Ugly Duckling—The Ugly Duckling is bitten by the ducks, chased by the chickens, and even disliked by the turkeys until one day when something special happens; **for ages 6-9.**
CT 11	The Frog Prince—A beautiful princess loses a golden ball, is forced to be friends with an ugly frog, and gets a great big surprise; **for ages 6-9.**
CT 12	Sleeping Beauty—Twelve fairies give wonderful gifts to the new princess, but the Thirteenth Fairy brings a gift we wish could be refused; **for ages 8-11.**
CT 13	Scheherazade and the Arabian Nights—A modern adaptation about the beautiful and wise storyteller who risks her life to save other women from a terrible fate; **for ages 8-11.**
CT 14	Aladdin and the Magic Lamp—An adaptation of one of Scheherazade's best known stories, about the Tailor's son and an evil magician; **for ages 8-11.**
CT 15	The Story of Atlantis—A haunting story of the legendary continent that vanished; **for ages 8-11.**
CT 16	The Great Pyramids—A look at the mystery of one of the modern world's greatest wonders; **for ages 8-11.**

Send for a free catalog of over 1000 educational programs Atari, Apple, TRS 80 Color Computers.

DORSETT
Educational Systems, Inc.
Box 1226, Norman, OK 73070
IN OKLAHOMA CALL (405) 288-2301

CALL TOLL FREE
for more information
1-800-654-3871
Dealer inquiries welcome

MasterCard VISA

PRINT #-2,

Some good news and some bad news this month . . . followed by some more good news.

One of the most innovative projects which has hit the computer marketplace this year has been Radio Shack's series of Personal Computer Showcases in five cities across the United States during September and October. These showcases played to good crowds in Houston, Atlanta, Los Angeles, New York and Chicago, and offered an awful lot of people an opportunity to see what Radio Shack has to offer in the way of computer hardware and software.

What was unique — at least for Radio Shack — was that third party vendors were not only allowed to participate, but made up the bulk of the people with products on display. And, friends, it really did do my heart good to see some of the "giants" of the industry — Small Computer Company, Lotus, MicroPro, IUS and the like — among those who chose to exhibit.

One of the reasons the Personal Computer Showcases were so unusual was because there was no fee to exhibit. That certainly did not mean exhibiting was free — after all, the majority of the expense for a show is not in the space rental. Yet, Radio Shack went out of its way to encourage as many firms as possible to participate in the Showcases — even to arranging discount air fare and hotel rooms!

We were proud that THE RAINBOW was able to participate in all five Showcases (along with its sister publication PCM). And, while only one software firm participated in all five Showcases, there was a good regional representation by other companies at each show. Radio Shack also had its own CoCo booth! We went to the Showcases because we believed it was important to support this effort by Radio Shack, but, also, because it gave us an opportunity to tell literally thousands about our favorite machines and the publications we produce. Our participation in the Showcases has already resulted in additional subscriptions for THE RAINBOW.

Aside from that, how did the Showcases do? I must reflect on the two shows that I recently attended in Los Angeles — Comdex and the National Software Show. Radio Shack's Personal Computer Showcase in LA outdrew both of these "name" shows — and may have had more than both combined.

Admittedly, both Comdex and NSS were less than successful. And, while our own RAINBOWfest drew more last year in Long Beach, there were reasons for that. RAINBOWfest was on a holiday weekend (it will be this year in Irvine, too) and wasn't in the downtown area. As I said, Radio Shack can be proud of its "showing" at the shows. Crowds were good at all the other shows, too.

Our inside information is that there will be more Radio Shack Personal Computer Showcases, perhaps as soon as the Spring. Based on the success of these five, it would not surprise me if five more were in the offing. If one comes to your area, by all means attend. And drop by our booth to say "hello." If Radio Shack has another show, we'll be there!

My congratulations go to Mark Hulsizer and Phil Kitchen, who were the driving forces behind these Showcases. And, says my inside information, it was Board Chairman John Roach, himself, who came up with the idea. A good one, John.

Moreover, Radio Shack has once again disproved its critics who say that they oppose third party products in their field. Do you see other computer firms spending what must have been hundreds of thousands of dollars to showcase their products along with third party vendors? I think not.

On the bad news front, we are forced to announce an increase in subscription price, effective Jan. 1, 1985. There are two reasons for the increase: The two biggest P's of publishing — paper and postage.

No doubt you have read that second class postage rates will go up the first of the year by some 16 percent. At the same time, paper prices have increased (or will increase by January 1) some 17 percent. This represents a substantial increase in what it costs us to deliver THE RAINBOW to you.

So, beginning Jan. 1, 1985, the regular one year subscription price for THE RAINBOW will increase by $3, to $31 per year. Our earlier projections were that we would have to raise prices by $6 (to $34) but, for reasons I mentioned here two months ago, we have been able to halve what we thought we were going to have to

Telewriter-64™
the Color Computer Word Processor

- **3 display formats: 51/64/85 columns × 24 lines**
- **True lower case characters**
- **User-friendly full-screen editor**
- **Right justification**
- **Easy hyphenation**
- **Drives any printer**
- **Embedded format and control codes**
- **Runs in 16K, 32K, or 64K**
- **Menu-driven disk and cassette I/O**
- **No hardware modifications required**

THE ORIGINAL

Simply stated, Telewriter is the most powerful word processor you can buy for the TRS-80 Color Computer. The original Telewriter has received rave reviews in every major Color Computer and TRS-80 magazine, as well as enthusiastic praise from thousands of satisfied owners. And rightly so.

The standard Color Computer display of 32 characters by 16 lines without lower case is simply inadequate for serious word processing. The checkerboard letters and tiny lines give you no feel for how your writing looks or reads. Telewriter gives the Color Computer a 51 column by 24 line screen display with *true lower case characters*. So a Telewriter screen looks like a printed page, with a good chunk of text on screen at one time. In fact, more on screen text than you'd get with Apple II, Atari, TI, Vic or TRS-80 Model III.

On top of that, the sophisticated Telewriter full-screen editor is so simple to use, it makes writing fun. With single-letter mnemonic commands, and menu-driven I/O and formatting, Telewriter surpasses all others for user friendliness and pure power.

Telewriter's chain printing feature means that the size of your text is never limited by the amount of memory you have, and Telewriter's advanced cassette handler gives you a powerful word processor without the major additional cost of a disk.

> *...one of the best programs for the Color Computer I have seen...*
> — Color Computer News, Jan. 1982

TELEWRITER-64

But now we've added more power to Telewriter. Not just bells and whistles, but major features that give you total control over your writing. We call this new supercharged version Telewriter-64. For two reasons.

64K COMPATIBLE

Telewriter-64 runs fully in any Color Computer — 16K, 32K, or 64K, with or without Extended Basic, with disk or cassette or both. It automatically configures itself to take optimum advantage of all available memory. That means that when you upgrade your memory, the Telewriter-64 text buffer grows accordingly. In a 64K cassette based system, for example, you get about 40K of memory to store text. So you don't need disk or FLEX to put all your 64K to work immediately.

64 COLUMNS (AND 85!)

Besides the original 51 column screen, Telewriter-64 now gives you 2 additional high-density displays: 64 × 24 and 85 × 24!! Both high density modes provide all the standard Telewriter editing capabilities, and you can switch instantly to any of the 3 formats with a single control key command.

The 51 × 24 display is clear and crisp on the screen. The two high density modes are more crowded and less easily readable, but they are perfect for showing you the exact layout of your printed page, *all on the screen at one time*. Compare this with cumbersome "windows" that show you only fragments at a time and don't even allow editing.

RIGHT JUSTIFICATION & HYPHENATION

One outstanding advantage of the full-width screen display is that you can now set the screen width to match the width of your printed page, so that "what you see is what you get." This makes exact alignment of columns possible and it makes hyphenation simple.

Since short lines are the reason for the large spaces often found in standard right justified text, and since hyphenation is the most effective way to eliminate short lines, Telewriter-64 can now promise you some of the best looking right justification you can get on the Color Computer.

FEATURES & SPECIFICATIONS:

Printing and formatting: Drives any printer (LPVII/VIII, DMP-100/200, Epson, Okidata, Centronics, NEC, C. Itoh, Smith-Corona, Terminet, etc).

Embedded control codes give full dynamic access to intelligent printer features like: underlining, subscript, superscript, variable font and type size, dot-graphics, etc.

Dynamic (embedded) format controls for: top, bottom, and left margins; line length, lines per page, line spacing, new page, change page numbering, conditional new page, enable/disable justification.

Menu-driven control of these parameters, as well as: pause at page bottom, page numbering, baud rate (so you can run your printer at top speed), and Epson font. "Typewriter" feature sends typed lines directly to your printer, and Direct mode sends control codes right from the keyboard. Special Epson driver simplifies use with MX-80.

Supports single and multi-line headers and automatic centering. Print or save all or any section of the text buffer. Chain print any number of files from cassette or disk.

RAINBOW
CERTIFICATION
SEAL

File and I/O Features: ASCII format files — create and edit BASIC, Assembly, Pascal, and C programs, Smart Terminal files (for uploading or downloading), even text files from other word processors. Compatible with spelling checkers (like Spell 'n Fix).

Cassette verify command for sure saves. Cassette auto-retry means you type a load command only once no matter where you are in the tape.

Read in, save, partial save, and append files with disk and/or cassette. For disk: print directory with free space to screen or printer, kill and rename files, set default drive. Easily customized to the number of drives in the system.

Editing features: Fast, full-screen editor with wordwrap, block copy, block move, block delete, line delete, global search and replace (or delete), wild card search, fast auto-repeat cursor, fast scrolling, cursor up, down, right, left, begin line, end line, top of text, bottom of text; page forward, page backward, align text, tabs, choice of buff or green background, complete error protection, line counter, word counter, space left, current file name, default drive in effect, set line length on screen.

Insert or delete text anywhere on the screen without changing "modes." This fast "free-form" editor provides maximum ease of use. Everything you do appears immediately on the screen in front of you. Commands require only a single key or a single key plus CLEAR.

> *...truly a state of the art word processor... outstanding in every respect.*
> — The RAINBOW, Jan. 1982

PROFESSIONAL WORD PROCESSING

You can no longer afford to be without the power and efficiency word processing brings to everything you write. The TRS-80 Color Computer is the lowest priced micro with the capability for serious word processing. And only Telewriter-64 fully unleashes that capability.

Telewriter-64 costs $49.95 on cassette, $59.95 on disk, and comes complete with over 70 pages of well-written documentation. (The step-by-step tutorial will have your writing with Telewriter-64 in a matter of minutes.)

To order, send check or money order to:

Cognitec
704 Nob Street
Del Mar, CA 92014

Or check your local software store. If you have questions, or would like to order by Visa or Mastercard, call us at (619) 755-1258 (weekdays, 8AM-4PM PST). Dealer inquiries invited.

(Add $2 for shipping. Californians add 6% state tax. Allow 2 weeks for personal checks. Send self-addressed stamped envelope for Telewriter reviews from CCN, RAINBOW, 80-Micro, 80-U.S. Telewriter owners: send SASE or call for information on upgrading to Telewriter-64. Telewriter-compatible spelling checker (Spell 'n Fix) and Smart Terminal program (Colorcom/E) also available. Call or write for more information.)

Apple II is a trademark of Apple Computer, Inc.; Atari is a trademark of Atari, Inc.; TRS-80 is a trademark of Tandy Corp; MX-80 is a trademark of Epson America, Inc.

What Does Dugger's Growing Systems Grow?

We grow C Compilers ($120 value)
generate fast, efficient code
longs, floats, most operators
FLEX* $75.00
new OS-9* $59.95
COCO DOS $49.95

We grow Relocatable Macro Assemblers
($150 value)
Assembler, linker, library builder
symbols up to 32 characters
"fortran-like" common
FLEX* $75.00
new OS-9* $75.00
COCO DOS $49.95

We grow Orchids
Odontoglossums
write for catalog and price list

We grow HI RES OS-9 "Windows"
52 x 24 hi-res display
new cursor control
multi-window displaying
OS-9* $34.95

We grow Orchids
intergeneric hybrids
write for catalog and price list

We grow OS-9 Experts
Over 6 years experience with OS-9
Used in development of major project
Experts in both levels 1 and 2

Quality
quality at an affordable price
all products tested and proven

Solid Authorship Royalties
royalties up to 20% of selling price
Only quality products accepted

ORDER NOW! YOU OWE IT TO YOURSELF

All orders add $3.00 for shipping
VISA and MC welcomed
Foreign orders add 15%
California orders add 6%

For more information write or call:
DUGGER'S GROWING SYSTEMS
Post Office Box 305
Solana Beach, Calif. 92075
(619) 755-4373
Technical information 6 am to 8 am PDT only
Dealer inquiries welcome

*Flex—trademark of TSC, OS-9 trademark of Microware

charge. Other rates will also increase by $3 — up to $38 in Canada and Mexico, $68 for foreign surface and $103 for foreign subscriptions by air.

But, to every cloud, there is a silver lining. Here, it is that you can renew your subscription, now, at the present rate of $28 for U.S. subscriptions ($35 for Canada and Mexico; $65 for foreign surface and $100 for foreign air). So long as your renewal is postmarked by Dec. 31, 1984, you can sign up for another year of THE RAINBOW at the present rate! This applies even if you have just renewed your subscription. But, renew now. We will not accept renewals at the old rate postmarked after Dec. 31, 1984.

I am pleased to report to you that RAINBOWfest in Princeton was a success, as we expect February's show in Irvine, Calif., to be. Now would be the time to order tickets. It is over President's Day Weekend, so you'll have an extra day to travel and to enjoy the fine weather in Southern California. And, the holiday weekend means that Disneyland will be open on Monday, as will all the other attractions in the area. Plan to make a weekend out of it and come to the "largest Color Computer Exhibition" ever offered, anywhere!

By way of finally, one of the things about which I have become increasingly encouraged in the past few months is the "language expansion" of CoCo.

Somehow, it has always seemed to me that having just one language available for programming on any single computer was a disadvantage — more perceived than real, perhaps. But, it always appeared that the "big time" computers had a wealth of language in which people could program.

Add CoCo to the list. LOGO has been available for some time now; C is something that many programmers believe is the "wave of the future"; PASCAL has a couple of versions (and its own RAINBOW column); and now, CP/M is also available from two manufacturers.

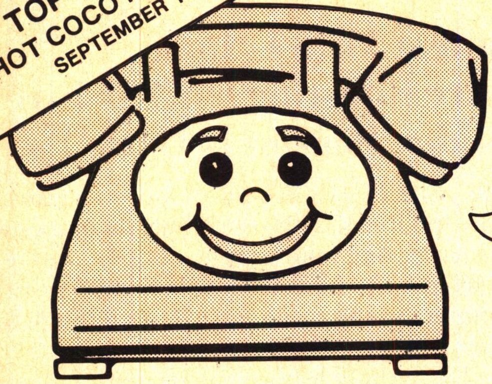
Which one is most significant? I don't know. CP/M gives access to a wealth of programs that have been in use for some time. PASCAL is very flexible, and very popular in educational circles. C is, as I said, a "new" language that is steadily increasing in popularity. And LOGO is an excellent learning tool for youngsters.

Add those to BASIC and you can count five languages for CoCo. Not bad. Not bad at all.

— Lonnie Falk

RAINBOWfest
Irvine
Feb. 15-17

TOP RATINGS
HOT COCO MAGAZINE
SEPTEMBER 1984



YOU
COULD FALL IN LOVE WITH
AUTOTERM!
IT TURNS YOUR COLOR COMPUTER INTO THE
WORLD'S SMARTEST TERMINAL

AND MOST LOVABLE

GOOD LOOKIN'

AUTOTERM shows true upper/lower case in screen widths of 32, 40, 42, 51, or 64 characters with no split words. The width of 32 has extra large letters. Scrolling is forward, backward, and fast. Block graphics pictures are displayed automatically and can be scrolled.

The screen's top line shows operating mode, unused memory size, memory on/off, and caps-lock on/off. It also gives helpful prompts.

SWEET TALKIN'

KEY-BEEP can be on/off. Unacceptable keystrokes cause a lower pitched BOP! This ERROR-BEEBOP can be on/off.

Talks to other computers with Full or Half Duplex; Baud Rate of 110, 150, 300, 600, 1200; Parity as even, odd, mark, space, none; 7 or 8 bit Word; any Stop Bits; all 128 ASCII characters; true line Break; XON/XOFF protocol; and optional line-at-a-time transmission. Able to send and receive text, block graphics, BASIC and ML programs. A 64K machine holds up to 46,600 characters (34,900 in HI-RES).

DUAL PROCESSING lets you review & edit while more data is coming in.

Fully supports D.C. Hayes and other intelligent modems.

Talks to your printer with any page size, margins, line spacing, split word avoidance. Embed your printer's control sequences for boldface, underlining, etc. Narrow text can be automatically spread out.

You'll also use Autoterm for simple word processing and record keeping

You can display directories, delete files, transmit directly from disk, and work with files larger than memory. Easily maintain a disk copy of an entire session.

Compatible with TELEWRITER (ASCII) & other word processors.

SMOOTH WALKIN'

AUTOTERM moves smoothly and quickly between word processing and intelligent terminal action. Create text, correct your typing errors; then connect to the other computer, upload your text, download information, file it, and sign-off; then edit the received data, print it in an attractive format, and/or save it on file.

Editing is super simple with the cursor. Find strings instantly, too! Any operating parameter, such as screen width, can be altered at any time. Uncompleted commands can be cancelled.

PUTTY IN YOUR HANDS

The word processor can be used to create, print, and/or save on file your personal KSMs. They let AUTOTERM act like you. For example, it can dial through your modem, sign-on, interact, perform file operations, & sign-off; an entire session without your help. KSMs can answer the phone, prompt the caller, take messages, save them, hang-up, and wait for the next call. The KSM potential is unbelievable! NO OTHER COMPUTER IN THE WORLD CAN MATCH YOUR COCO'S AUTOMATIC TERMINAL CAPABILITIES!!!!!

WHAT THE REVIEWERS SAY

"AUTOTERM is the Best of Class."

Randolf W. Graham
the RAINBOW, June, 1983

"The Autoterm buffer system is the most sophisticated — and one of the easiest to use . . ."

W.C. Banta
HOT CoCo, September, 1984

"Almost a full featured word processor . . ."

Ed Ellers
the RAINBOW, November, 1984

RECOMMEND 32K to 64K
Tape-to-Disk Upgrade $23
You Keep the Cassette

CASSETTE $39.95
DISKETTE $49.95
Add $3 shipping and handling
MC/VISA/C.O.D.

PXE Computing
11 Vicksburg Lane
Richardson, Texas 75080
214/699-7273

Please hire the mentally retarded. They are sincere, hard working and appreciative. *Thanks! Phyllis.*

NEW SOFTWARE PACKAGES
Two new disk utilities for The Color Computer

Free Book worth $14.95 with each order. See offer below!

DMAGIC

Several menu driven aids to keep your disks clean & tidy

- Copy, load, rename and delete files as you step thru the disk directory with single keystroke commands. No more frustrating file name spelling errors!
- Page feature displays 26 directory files at a time. No more dir "fly-by."
- Sort directory and store on disk in alphabetical order.
- Find machine language start/end/ execution addresses.
- For single or multiple drives.
- R.S. color DOS—16k minimum required.
- Supplied on disk—**$19.95**

PRO-LOC

Control access to sensitive programs and files.

- The PRO-LOC loader allows programs to be saved to disk in a password protection mode. The program will not load or run unless proper password supplied.
- Data and text files can also be "locked" with PRO-LOC.
- Easy to use—menu driven commands.
- R.S. color DOS with 16k minimum required.
- Supplied on disk—**$19.95.**

FREE with each order—
THE POWER OF THE TRS-80 COLOR COMPUTER. This illustrated book is compiled with 29 **NEW** programs for fun and education. A guide to programming the full range of color computer capabilities, it helps users write intelligent and well thought out programs. **Regular price $14.95.**

We accept Master Card, VISA, check or money order.

Original color computer software wanted. High royalties paid.

Please send me:
___ DMAGIC @ $19.95 ______
___ PRO-LOC @ $19.95 ______
Add 5% sales tax if a resident of Massachusetts
TOTAL ______
NAME
ADDRESS
CREDIT CARD
CREDIT CARD NUMBER
EXPIRATION DATE

DORISON HOUSE PUBLSHERS, INC.
824 Park Square Building
Boston, Massachusetts 02116

BUILDING DECEMBER'S RAINBOW

The Adventure Contest Vote Is In . . . The Chestnuts Are Roasting On The Fire . . . And The Holiday Season Is Upon Us . . .

As this special Adventure issue of THE RAINBOW goes to press, our peerless managing editor, Jim Reed, is off on adventures of his own in Europe and Northern Africa. Jim, who usually "builds" THE RAINBOW on this page each month, asked me to fill in for him in his absence and, I have to admit, I was rather honored by the invitation. Jim is a tough act to follow, but somebody has to do it.

We have a running joke around here about leaving pages empty and putting "Notes" at the top. Besides, if *somebody* didn't build THE RAINBOW each month, Roy G. Biv wouldn't exist, Judy Garland wouldn't have had anything to sing about for all these years, and the Color Computer would have lost its best friend.

Without question, the widest and brightest band in THE RAINBOW's spectrum this month is, at long last, the announcement of the winners of the Second Annual Rainbow Adventure Contest. I know that many of you have awaited this moment with bated breath — or at least the contestants, anyway — and I'm confident that, after introducing yourselves to the two winners published in this issue for a few hours, you will not be disappointed with the wait. The Grand Prize winner, Steven Mitchell's *Rescue On Alpha II*, is a graphics Adventure as good as any ever written in BASIC. And the 16K Best of Show winner, Mark Nelson's *Head Of The Beast*, is a novel little Adventure that works wonders within the limitations of the 16K environment.

With these two winners, you can be assured that multiple hours of entertainment lay before you. And these are only two of the 18 winners selected in the Adventure contest. The other 16 will lie dormant for a few more short weeks until they burst forth in the second *Rainbow Book Of Adventures*. When that time comes, you can don your vintage flight jacket, cock your fedora down jauntily over your eyes, and say goodbye to your family for a week or two — it's time for Adventure once again!

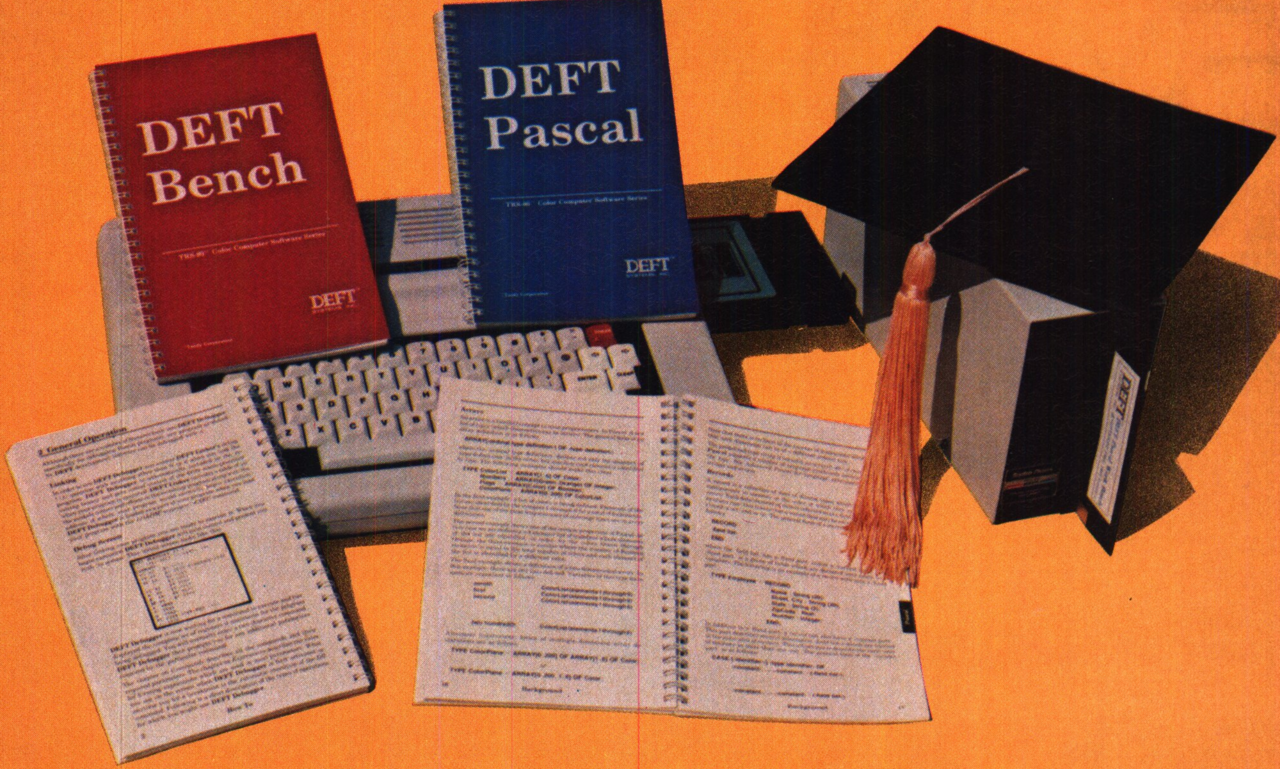
Going beyond Adventures, we mustn't get so carried away that we forget that it's the holiday season. And not only is this the special Adventure edition of THE RAINBOW, it's the special Christmas issue as well. Leading the holiday parade of features this month is a program to set the tone for those that follow: a music and graphics program that will do wonders for putting you in the spirit of the season. Following that is another graphics program, also seasonal, that wishes your friends and family a holiday greeting that will warm hearts in the coldest of weather.

But your CoCo shouldn't spend the entire holiday season playing carols and making pretty pictures, should it? Let's put it to work so that you can do some caroling of your own! Toward this end, we offer two programs that will make the dreaded task of preparing holiday greeting cards as much a thing of the past as adorning your tree with lighted candles. The first, a Christmas card file and labeler, can be used to sort, list, label, delete, edit, update, and keep track of incoming and outgoing cards — just about everything but lick the Christmas seal! And then, a printer graphics program that will allow you to print your own personalized greeting cards in five colors on an Epson or Gemini dot-matrix printer.

So, as you can see, even though we've been up to our eyelids in Adventures, we certainly haven't forgotten what time of year it is. And from the heart of beautiful, downtown Prospect, all of us here at THE RAINBOW would like to wish you the very happiest of holiday seasons. May the CoCo Community, giving thanks for times past, turn now to a prosperous new year.

— Kevin Nickols

Graduate With DEFT Pascal



As a result of the programming language requirement of the Advanced Placement (AP) Tests, Pascal has become the standard language used in High Schools and Colleges today. On the Color Computer, DEFT Pascal is the standard.

DEFT Bench $49.95

DEFT Edit
Full screen editor

DEFT Linker
(see **DEFT Pascal**)

DEFT Lib
create and maintain program object libraries

DEFT Debugger
debug Pascal machine programs **symbolically**

DEFT Macro/6809
supports entire 6809 instruction set, lets you define your own instructions

RS# 90-5001

DEFT Pascal $79.95

DEFT Pascal *Compiler*
complete **Pascal** language, generates machine language object

DEFT Linker
combines multiple program objects into one binary program

RS# 90-5000

DEFT Pascal Workbench $119.95

(DEFT Pascal And DEFT Bench Together)

RS# 90-5002

All **DEFT** software and programs developed with **DEFT** software are BASIC ROM independent and **use all** of the **memory** in your Color Computer **without OS-9**. All you need is **DEFT** software and a TRS-80 Color Computer with Extended Disk BASIC, at least 32K of RAM and One Disk Drive. With **DEFT Pascal** ($79.95) you will also need a text editor to write your programs. Software licensing arrangements are available for schools. Dealer inquiries welcome.

DEFT™
SYSTEMS, INC.

**Now Available
By Express Order
At Your Local
Radio Shack Store!**

Orders and Sales Information **1-800-992-DEFT**
Technical Assistance **1-301-253-1300**

Quantity of Each: __ **DEFT Pascal** __ **DEFT Bench** __ **DEFT Pascal Workbench**

Method of Payment (check one) ☐ Check Enclosed ☐ VISA ☐ Master Card ☐ COD

Account Number ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐

Card Expiration Date ☐☐ / ☐☐

Signature ____________________

Name ____________________

Street ____________________

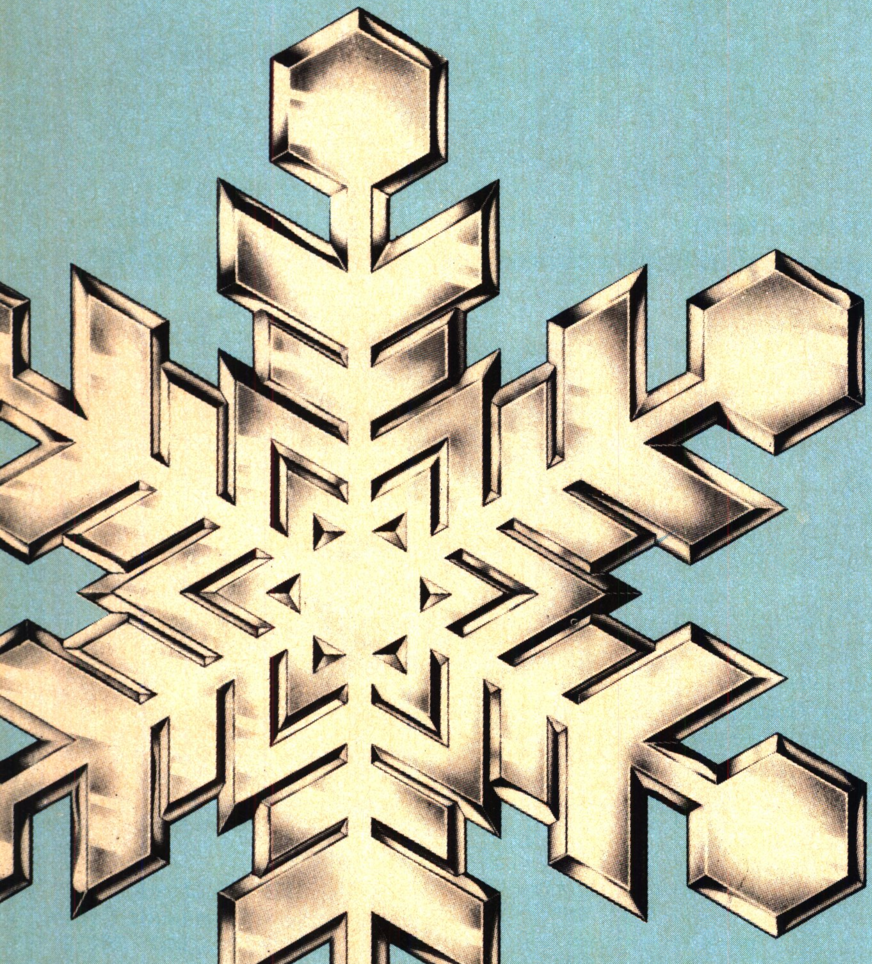
City ____________________ State ☐☐ Zip ☐☐☐☐☐

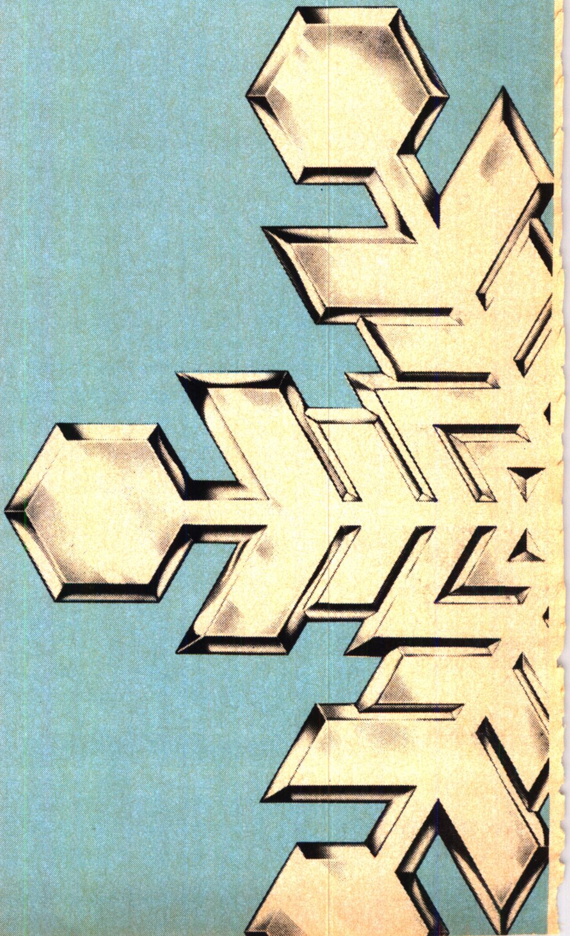
All orders are shipped UPS within 24 hours of receipt. Add 3% for shipping and handling; Maryland residents add 5% for State Sales Tax; add $2.00 for COD.

**DEFT Systems, Inc.
Suite 4, Damascus Centre
Damascus, MD 20872**

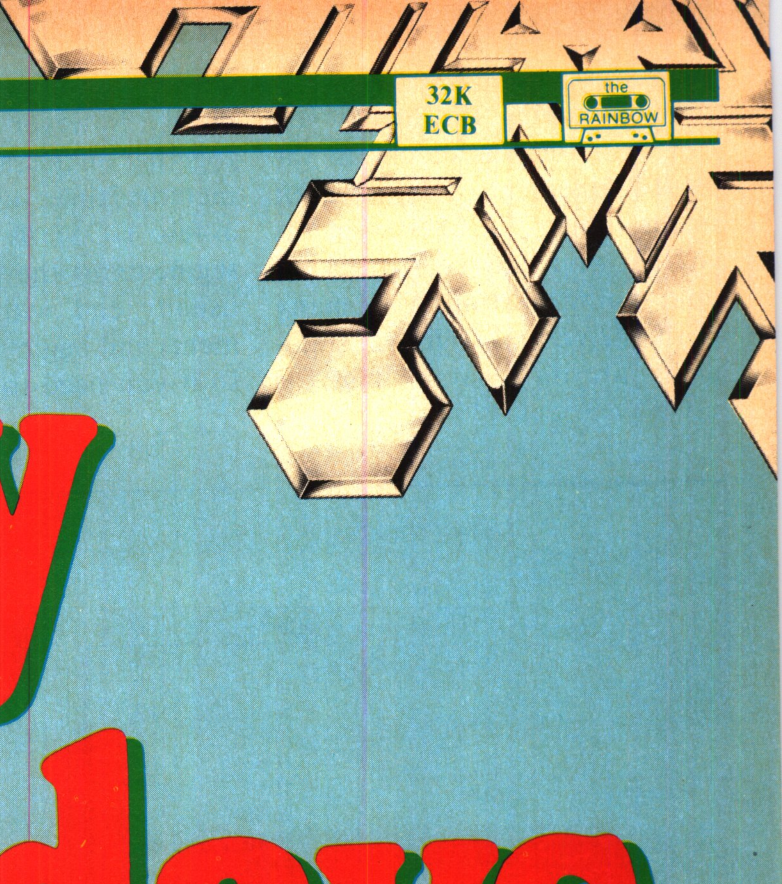
DEFT is a Trademark of DEFT Systems, Inc. **TRS-80** is a Trademark of TANDY Corporation

Holly



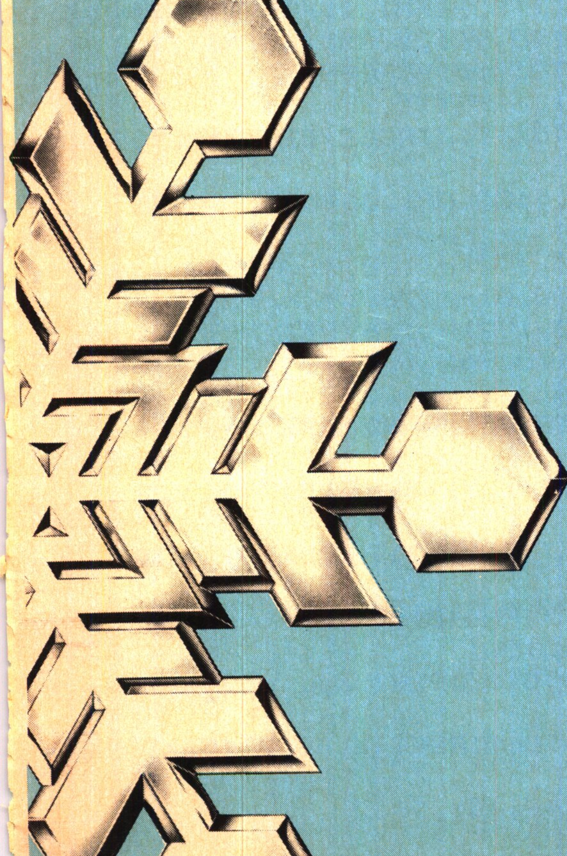


32K
ECB



Jolly Holidays

By Robert T. Rogers



This is a fun program for the holidays that combines CoCo's great sound and graphics capabilities. It consists of a series of Hi-Res Christmas scenes, each followed by an appropriate holiday song. It should fit in 16K, even though it was written on a 32K machine. If necessary, remove one picture and its music. Unfortunately one cannot have graphics being drawn or animation taking place during the *PLAYing* of a song, but it still is interesting. Anyone can add or change the scenes and add new songs easily; just tack them at the end and change the line with *RUN* in it.

Below is a listing of the scenes and songs:

1) Snowman, *Frosty The Snowman* (also circle designs)
2) Christmas Tree, *Oh Christmas Tree*
3) Star, *Silent Night*
4) Computer, *Holly Jolly Christmas*
5) House In Winter, *White Christmas*
6) Sing Along, *Jingle Bells*
7) World Flag Salute, *Joy To The World*

When typing the listing you can omit the semicolons in the *PLAY* statements. They were left in the longer *PLAY* statements so that you can keep track of your typing location. Also, many of the *LINE* and *CIRCLE* statements are on separate lines for clarity; however they can be put together on the same lines to save memory/time, just watch out for a few *GOSUBs*. The different segments of the programs most usually end with *PLAY* statements and begin with *PMODEs*, so if you need to eliminate routines to conserve memory, look at these areas for hacking.

(Robert Rogers is a junior at Forest Hill High School in West Palm Beach, Fla., who has been a self-taught programmer for two years. His interests include performing professionally on the organ and model railroading.)

17	248
34	249
60	23
79	14
106	71
1017	228
2050	4
3040	39
END	36

The listing:

```
0 'COPYRIGHT (C) 1983 BY ROBERT
 T. ROGERS
1 SCREEN0,1:CLS5:FORX=0TO31STEP2
:FORH=0TO63:C=RND(2):IFC=2THENC=
4
2 SET(H,X,C):NEXTH,X
3 PRINT@224,"* A COLOR COMPUTER
CHRISTMAS ! *";:FORX=1TO255STEP5
:SOUNDX,1:NEXTX
5 PCLEAR4:CLEAR1000:PMODE3,1:COL
OR5,6:PCLS:SCREEN1,1
6 CIRCLE(128,151),43,5
7 PAINT(128,150),5,5
8 CIRCLE(128,82),35,5
9 PAINT(128,84),5,5
10 CIRCLE(128,27),25,5
11 PAINT(128,27),5,5
12 CIRCLE(128,27),3,8:PAINT(128,
27),8,8
13 CIRCLE(128,27),15,7,1,0,.50
14 CIRCLE(122,21),3,7:CIRCLE(134
,21),3,7
15 PAINT(122,21),7,7:PAINT(134,2
1),7,7
16 CIRCLE(128,72),7,7:CIRCLE(128
,92),7,7
17 PAINT(128,72),7,7:PAINT(128,9
2),7,7
18 FORX=1TO500:PSET(RND(256),RND
(192),5):NEXTX
19 A$="T4;L2;G;L4.;E;L8;F;L4;G;L
2;O4;C;O3;L8;B;O4;C;L4;D;C;O3;B;
L8;A;G;L2.;G;L8;B;O4;C;L4;D;C;O3
;B;L8;AA;G;L4;O4;C;O3;L4.;E;L8;G
A;L4;GFE":B$="F;L2.;G;P8"
20 C$="L4;D;L2.;C;L4;C;AA;O4;CC;
O3;BAGEFAGF;L2.;E;L8;EE;L4;DDGGB
B;O4;D;L8;D;O3;B;O4;L4;DC;O3;BA;
L2;GG"
21 PLAY A$+B$:PLAYA$:PLAYC$:PLAY
 A$+"L4;D;L2.;C;P8"
22 PLAY"L8;GG;L4;GGG;L8;AG;L4;GG
GAGEG;L1;D;L8;GG;L4;GGG;L8;AG;L4
GGG;L8;GG;L4;GAB;O4;L2.;C"
23 FORX=0TO255:LINE(128,96)-(X,0
),PSET:NEXTX:FORY=0TO192:LINE(12
8,96)-(256,Y),PSET:NEXTY:FORX=25
6TO0STEP-1:LINE(128,96)-(X,192),
PSET:NEXTX:FORY=192TO0STEP-1:LIN
E(128,96)-(0,Y),PSET:NEXTY
24 PMODE3,1:SCREEN1,1:FORY=1TO20
0:CIRCLE(128,96),Y,RND(8):NEXTY
25 FORX=1TO1000:SCREEN1,0
26 SCREEN1,1:NEXTX
27 FORY=1TO170:CIRCLE(128,96),Y,
5:NEXTY
28 PMODE3,1:COLOR1,3:PCLS:SCREEN
1,0
32 LINE(80,192)-(128,0),PSET
33 LINE(128,0)-(176,192),PSET
34 LINE(80,192)-(176,192),PSET
35 PAINT(128,96),1,1
36 GOSUB43
37 FORE=1TO500:X=RND(255):Y=RND(
192)
39 IFPPOINT(X,Y)=3THENPSET(X,Y,2
)
40 IFPPOINT(X,Y)<>1THENNEXTE:GOT
O61
41 PSET(X,Y,RND(8))
42 NEXTE:GOTO61
43 FORY=20TO100:PSET(40,Y,2):NEX
TY
44 FORX=20TO60:PSET(X,40,2):NEXT
X
45 CIRCLE(40,40),10,2
```

```
46 COLOR4,3
47 LINE(190,192)-(200,172),PSET
48 LINE(200,172)-(210,192),PSET
49 LINE(190,192)-(210,192),PSET
50 PAINT(200,180),4,4
51 COLOR2,3
52 LINE(200,192)-(210,162),PSET
53 LINE(210,162)-(220,192),PSET
54 PAINT(210,180),2,2
55 COLOR1,3
56 LINE(210,192)-(220,152),PSET
57 LINE(220,152)-(230,192),PSET
58 PAINT(220,180),1,1:RETURN
60 GOTO60
61 REM
62 PLAY"T2;O1;L4;C;L8.;F;L16;F;L
4;F;G;L8.;A;L16;A;L4.;A;L8;A;G;A
;L4;B-;E;G;F;L4;C
63 PLAY"L8.;F;L16;F;L4;F;G;L8.;A
;L16;A;L4;AA;L8;GA;L4;B-;E;G;F
64 PLAY"P8;L8;O2;CC;O1;A;O2;L4.;
D;L8;C;C;O1;B-;L4.;B-;L8;B-;B-;G
;L4.;O2;C;O1;L8;B-;B-;A;L4;A;C;L
8.;F;L16;F;L4;F;G;L8.;A;L16;A;L4
.;A;L8;A;G;A;L4;B-;E;G;L2;F
65 COLOR1,1
66 FORY=0TO192:LINE(0,Y)-(256,Y)
,PSET:NEXTY
67 PMODE4,1:PCLS:SCREEN1,1
68 DRAW"BM68,116;E20;BE20;E20;F2
0;BF20;F20;L40;BL40;L40;BU40;R40
;BR40;R40;G20;BG20;G20;H20;BH20;
H20;BM128,96;NU40;ND40;NE20;NF20
;NG20;NH20;NL40;R40"
69 FORY=1TO200:PSET(RND(256),RND
(192)):NEXTY
70 A$="O1;T1;L8.;G;L16;A;L8;G;L4
.;E"
71 A$=A$+A$
72 A$=A$+"O2;L4;D;L8;D;L4.;O1;B;
L4;O2;C;L8;C;O1;L4.;G"
73 B$="L4;A;L8;A;O2;L8.;C;O1;L16
;B;L8;A;L8.;G;L16;A;L8;G;L4.;E"
74 C$="O2;L4;D;L8;D;L8.;F;L16;D;
O1;L8;B;L4.;O2;C;E;L8.;C;O1;L16;
G;L8;E;L8.;G;L16;F;L8;D;L2.;C"
75 PLAYA$:PLAYB$:PLAYB$:PLAYC$
76 PMODE3,1:PCLS:SCREEN1,0
77 LINE(80,0)-(176,68),PSET,B
78 LINE(176,0)-(196,68),PSET,B
79 CIRCLE(186,20),7,2:CIRCLE(186
,40),7,3
80 LINE(80,76)-(196,76),PSET
81 LINE(80,76)-(64,140),PSET
82 LINE(196,76)-(212,140),PSET
83 LINE(64,140)-(212,140),PSET
84 PAINT(128,40),3,4
85 HH=64
86 FORH=80TO196STEP11.6
87 LINE(H,76)-(HH,140),PSET
88 HH=HH+14.8
89 NEXTH
90 HH=196
91 H=80
92 FORV=76TO140STEP12.8
93 LINE(H,V)-(HH,V),PSET
94 H=H-3.2:HH=HH+3.2
95 NEXTV
96 LINE(64,140)-(212,150),PSET,B
F
97 FORY=1TO150
98 H=RND(196):V=RND(76):IFPPOINT
(H,V)<>3THEN98
99 PSET(H,V,RND(8)):SOUNDRND(255
),1:NEXTY
100 FORU=1TO200
101 X=RND(116)+80:Y=RND(140)
102 IF Y<77THEN105
103 IFPPOINT(X,Y)<>1THEN105
104 PAINT(X,Y),2,4:SOUNDRND(20),
1
105 NEXTU
106 A$="T4;O2;L8;EG;O3;L4;CC;O2;
BB;A;L2;E;L8;EG;L4;AA;G;L8;G;O1;
B;L1;B;O2;L4;BB;L4.;B;L8;A;L4;GG
;L4.;G;L8;E;L4;GGF"
107 B$="L8;GE;L2.;E"
```

SPECTRUM PROJECTS
Announces The Appointment Of
DERBY CITY SOFTWARE
As Spectrum's new
Southern Division Distributor
(AL, FL, GA, KY, LA, MS, NC, SC TN, TX)

FIRST TIME ORDER SPECIAL

SOFTWARE — 10% OFF
HARDWARE — 5% OFF

EXCLUSIVE DERBY CITY ITEMS

DISK SORT & ORDER
A disk utility that will eliminate all sectored data and alphabetize the directory. Also will allow the conversion of A RS-35 Diskette to a JDOS 40 track. One or more drives. $11.95

CGP-115 PRINTER/PLOTTER UTILITIES
PP Color Dump — All machine language - fastest and highest quality screen dump for CGP-115 **ANYWHERE**. Works in all PMODES and compatable with Graphicom. Many powerful and user friendly features. $19.95

PP Color Bio-Rhythm — Prints out a four color one year Bio-Rhythm. One month/Pages with both graph and daily codes fully color coded. Accurate to the year 2000. $10.95

EPSON RX-80 Screen Dump Utility
All machine language - full page pictures in less than 3 minutes. Works in PMODES 3 & 4 - Compatible with Graphicom. $9.95

RS-232-C SERIAL PORT 2 POSITION SWITCH
Black Case with gray face and toggle switch. No sodering - just plug in $19.95

DERBY CITY SOFTWARE
3141 Doreen Way
Louisville, KY 40220
(502) 458-6690; In Canada call: 1-800-361-5155

All orders add $3.00 shipping & handling: KY residents add 5% sales tax.
C.O.D., VISA, MasterCard and Cash

```
108 C$="L4;D;L1;C;L2;O3;C;L4.;O2
;A;O3;L8;C;O2;L4;B;G;L2;G;L4;AFF
A;L1;G;L2;F;L4.;D;L8;F;L4;EA;L2;
A;L4;DDE;F+;L2.;G
109 D$="L4;B;O3;L2.;C"
110 PLAYA$+B$:PLAYA$+C$:PLAYA$+D
$
1000 PMODE1,1:PCLS3:SCREEN1,1:CO
LOR1,0
1004 LINE(72,168)-(200,72),PSET,
B
1005 LINE(72,71)-(136,36),PSET
1006 LINE(200,72)-(136,36),PSET
1007 LINE(120,168)-(152,100),PSE
T,B
1008 LINE(152,60)-(168,36),PSET,
BF
1009 LINE(165,128)-(191,100),PSE
T,B
1010 LINE(178,128)-(178,100),PSE
T
1011 LINE(165,114)-(191,114),PSE
T
1012 LINE(85,128)-(111,100),PSET
,B
1013 LINE(85,114)-(111,114),PSET
1014 LINE(98,100)-(98,128),PSET
1015 PAINT(83,112),4,1
1016 PAINT(83,69),5,1
1017 PAINT(125,155),2,1
1018 PSET(127,137,3)
1019 LINE(0,169)-(256,169),PSET
1020 PAINT(1,170),1,1
1021 CIRCLE(20,20),15,5
1022 PAINT(20,20),5,5
1023 LINE(15,168)-(30,100),PSET
1024 LINE-(45,168),PSET
1025 PAINT(30,167),1,1
1026 COLOR5,7
1027 FORU=1TO500
1028 X=RND(256):Y=RND(180)
1029 PSET(X,Y)
1030 NEXTU
1031 PLAY"O2;T3;L1;E;L4;FED+;E;L
1;F;L4;F+;L2.;G;L2;A;L4;B;O3;CDC
;O2;BA;L1.;G;L4;CD;L2;EE;L4;E;L2
;A;L4;G;L2;CC;L4;C;L2;G;L4;F;L1;
E"
1032 PLAY"L4;FEDC;L1..D;L1;E;L4;
FED+;E;L1;F;L4;F+;L2.;G;L2;A;L4;
B;O3;CDC;O2;BA;L1.;G;L4;CD;L2;EE
;L4;E;L2;A;L4;G;L1.;O3;C;O2;L4;C
D;L2;EE;L4.A;O1;L8;B;L4;BB;O2;L1
..;C"
2000 CLSRND(8):PRINT@224,STRING$
(64," ");
2050 PRINT@228,"DASHING THROUGH
THE SNOW":PLAY"T4O2L4DBAGL2.D":P
RINT@227,"IN A ONE HORSE OPEN SL
EIGH":PLAY"L8DDL4DBAGL2.E"
2051 PRINT@227,"  O'ER THE FIELD
S WE GO":PLAY"L4EEO3CO2BAL1F#":P
RINT@229,"LAUGHING ALL THE WAY":
PLAY"O3L4DDCO2AL1B":PRINT@229,"B
ELLS ON BOBTAIL RING":PLAY"L4DBA
GL2.D":PRINT@229,"MAKING SPIRITS
 BRIGHT":PLAY"L8DDL4DBAGL2.E"
2052 PRINT@224," OH WHAT FUN TO
RIDE AND SING A    SLEIGHING SON
G TONIGHT!":PLAY"L4EEO3CO2BAO3DD
DDEDCO2AL2.GP4
2053 PRINT@224,"   JINGLE BELLS!
 JINGLE BELLS!       JINGLE ALL
 THE WAY!":PLAY"L4BBL2BL4BBL2BL4
BO3DO2L4.GL8AL1B":PRINT@224," OH
 WHAT FUN IT IS TO RIDE IN A   O
NE HORSE OPEN SLEIGH-EIGH !":PLA
Y"O3L4CCL4.CL8CL4CO2BBL8BBL4BAAB
L2AO3D
2054 PRINT@224,"   JINGLE BELLS!
 JINGLE BELLS!       JINGLING A
LL THE WAY!":PLAY"O2L4BBL2BL4BBL
2BL4BO3DO2L4.GL8AL1B":PRINT@224,
" OH WHAT FUN IT IS TO RIDE IN A
     ONE HORSE OPEN SLEIGH!":PLA
Y"O3L4CCL4.CL8CL4CO2BBL8BB"
2060 PLAY"O3L4DDCO2L4AL1G"
```

THE SPANISH ARMADA

In the summer of 1588 King Philip of Spain's "Enterprize of England" sailed up the English Channel while Europe watched in apprehensive silence. The SPANISH ARMADA recreates the problems faced by the English Commanders as they struggled to defeat the Armada. Only this time it's up to you! Using weapons of the day, can you defeat the Armada? Cope with fickle winds? A relentless current? Difficulty of supply? It won't be easy, but it's fun to try.

The game requires at least a 32K computer and is compatible with either cassette or disc systems. Both versions are shipped on tape.

THE SPANISH ARMADA **$24.95**

Send check or money order to Picosoft Games, P.O. Box 35, Eighty Four, PA 15330; (412) 267-3721. Games are shipped postage paid. PA residents add 6% Tax. No delays for personal checks.

```
2999 SCREEN1,1
3000 CLS0:FORX=2TO61:FORY=2TO27:
SET(X,Y,4):NEXTY,X
3010 FORX=2TO61:FORY=4TO24STEP4:
SET(X,Y,5):NEXTY,X
3020 FORX=2TO27STEP2:FORY=2TO15:
SET(X,Y,3):NEXTY,X
3030 FORX=4TO24STEP4:FORY=4TO12S
TEP4:SET(X,Y,5):NEXTY,X:SCREEN0,
1
3040 PLAY"O3T4L2CO2L4.BL8AL2.G"
3050 PMODE1,1:PCLS5:CIRCLE(128,9
6),70,8:PAINT(128,96),8,8:SCREEN
1,1
3055 PLAY"T4L4FL2EL2DL2.C"
3060 PMODE1,3:PCLS5:COLOR7,5:LIN
E(0,0)-(85,191),PSET,BF:COLOR8,5
:LINE(255,0)-(171,191),PSET,BF:C
OLOR6,5:LINE(0,0)-(256,191),PSET
,B:SCREEN1,1
3065 PLAY"L4GL2.AL4AL2.BL4BO3L2.
C"
3070 PMODE1,1:PCLS2:COLOR3,2:LIN
E(0,0)-(85,191),PSET,BF:COLOR4,2
:LINE(255,0)-(171,191),PSET,BF:S
CREEN1,0
3075 PLAY"L4CCO2BAGL4.GL8FL4E"
3080 PMODE1,3:PCLS5:COLOR6,5:LIN
E(0,0)-(85,191),PSET,BF:LINE(255
,0)-(171,191),PSET,BF:SCREEN1,1
3085 PLAY"O3L4CCO2BAGL4.GL8FL4E"
3090 PMODE1,1:PCLS5:COLOR8,5:LIN
E(0,0)-(65,191),PSET,BF:LINE(255
,0)-(191,191),PSET,BF:DRAW"BM128
,96;H30;E30;F30;G30;D35":PAINT(1
28,70),8,8:SCREEN1,1
3095 PLAY"L4EEEEL8EFL2.G"
3100 PMODE1,3:PCLS5:COLOR8,5:LIN
E(0,96)-(255,191),PSET,BF:COLOR7
,5:LINE(0,0)-(255,191),PSET,B:SC
REEN1,1
3105 PLAY"L4DDDL8DEL2.F"
3110 PMODE1,1:PCLS5:COLOR6,5:LIN
E(0,0)-(85,191),PSET,BF:COLOR8,5
:LINE(255,0)-(171,191),PSET,BF:S
CREEN1,1
3115 PLAY"L8EDL4CO3L2CO2L4AL4.GL
8FL4EFL2EDL1C"
3200 SCREEN0,1:CLS0:PRINT@224,"
MERRY CHRISTMAS ALL COCO USERS
AND A HAPPY, HEALTHY NEW YEAR! "
;:FORT=1TO2:PLAY"T3O2L4GO3CL8CDC
O2BL4AAP32AO3DL8DEDCO2L4BGP32GO3
EL8EFEDL4CO2AP32L8GGL4AO3CO2BO3C
P4":NEXTT
4000 RUN
```

MasterCard

Educational Programs

VISA

BASKETBALL STATISTICS
Coaches, let CoCo do the paperwork! Keeps each individual game, plus league, non-league and all game totals for a maximum of 16 players in up to 29 games. Stats can be kept in as many as 17 different categories — assists, steals, field goals, and free throw stats (made-attempted-percentages), offensive and defensive rebounds, turnovers, personal fouls, charges, playing time, quarters played and points. Totals for the opposition team and for your individual players are printable. Your season record and scores to date are available anytime. Also, prints a year end summary of each individual player on a game by game basis. Team stats for your team and the opponents' totals for the year are included. Menu driven - Easy to Run - Excellent for most any basketball team.

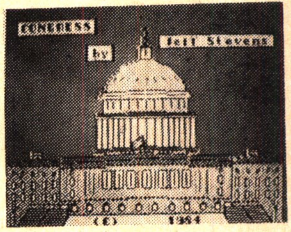
32K Disk
$29.95

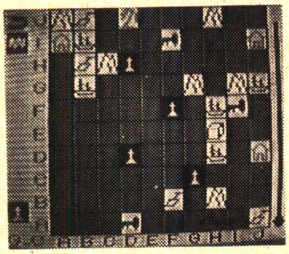
Write for a free brochure
or ask for a dealer demonstration. Priced from $9.95 to $31.95. Requires Extended Basic. Available for both tape and disk.

B-5 Software Co.
1024 Bainbridge Place
Columbus, Ohio 43228
Phone (614) 276-2752

CONGRESS
An award winning political simulation by Jeff Stevens. Have you ever wondered what it feels like to be the President of the United States? Congress lets you be the President. You select a program to get through Congress. You decide which states to influence through pork-barrel legislation. You assign lobbyists to the House or Senate, and you determine how to use log rolling favors. Finally, you decide whether to sign a bill into law or veto it. Your overall performance is rated in comparison to the popularity of other presidents. "Congress" also serves as a fine tutorial on how a bill becomes a law. It will add a spark to any government class. All would-be politicians will enjoy it.

Grades 7-12 and Adult
32K Cass. - $29.95
32K Disk - $31.95





RECESS GAMES
A superb Christmas gift! Four Games in one program provide an enjoyable format for using higher level thinking skills. Players must reason logically while playing Treasure Hunt, Masterbrain, Tic Tac Toe, and Number Guess. Children use co-ordinates and a hot/cold thermometer to find a treasure hidden behind a grid. Number Guess includes an optional use of a number line to help children approximate answers. In Masterbrain, players must consider the many possible ways to arrange specific digits to build numbers. Tic Tac Toe encourages children to predict and plan sequential moves. All games are multi-leveled so children of different ages can play the same game. One and two player options — Large graphic numerals — Attractive Screen Displays.

Grades 2-8
16K Cass.(2) - $19.95
32K Disk - $21.95

SPELLING
Add zest to the basics! **Spelling** allows you to input your own words and save them on data files (tape or disk). You may also purchase ready made data files (below). During the lesson a word flashes on the screen, and the student then types the word. If the word is misspelled, the correct spelling appears and aligns itself underneath the misspelling. The student can quickly determine the error and correct it. The score is given continuously, and all misspelled words are given at the end. A graphic display of superlative words and song provide a reward. Printer use is optional. **Spelling** will accept words with apostrophes, hyphens, and spaces. Word lists may be easily edited.

Grades 2-8.
16K Cass. - $19.95
32K Disk - $21.95

Data Files
Dolch Words
Most Misspelled
Space Words
Grades 2, 3, 4, 5, or 6
$8.95 each - Cass.
$10.95 each - Disk

TURN OF THE SCREW

Have a CoCo controlled light show with . . .

Lights! Camera! CoCo!

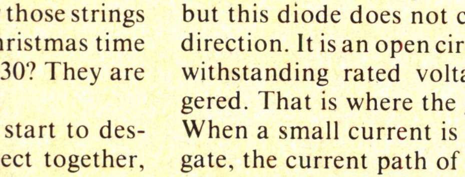
By Tony DiStefano
Rainbow Contributing Editor

This is an enlightening project which involves lights. That's right, a computer controlled light show. This could be used to light up your Christmas tree, brighten up your house or porch, or even change your den into a disco. You know those strings of lights you can buy at Christmas time that come in sets of 20 or 30? They are perfect to use.

Normally I would now start to describe how to put the project together, get the parts and run the thing, but one of my friends, Mike Schmidt, told me that I would do well to explain the theory of how my projects work. Well here goes, a little explanation goes a long way into understanding how the things work.

The heart of the project is based on a nifty little chip called a "thyristor." It is better known as a triac. To fully understand a triac, one must first look at an SCR (Silicon-Controlled-Rectifier). Figure 1 displays the schematic diagram of an SCR.

FIGURE 1



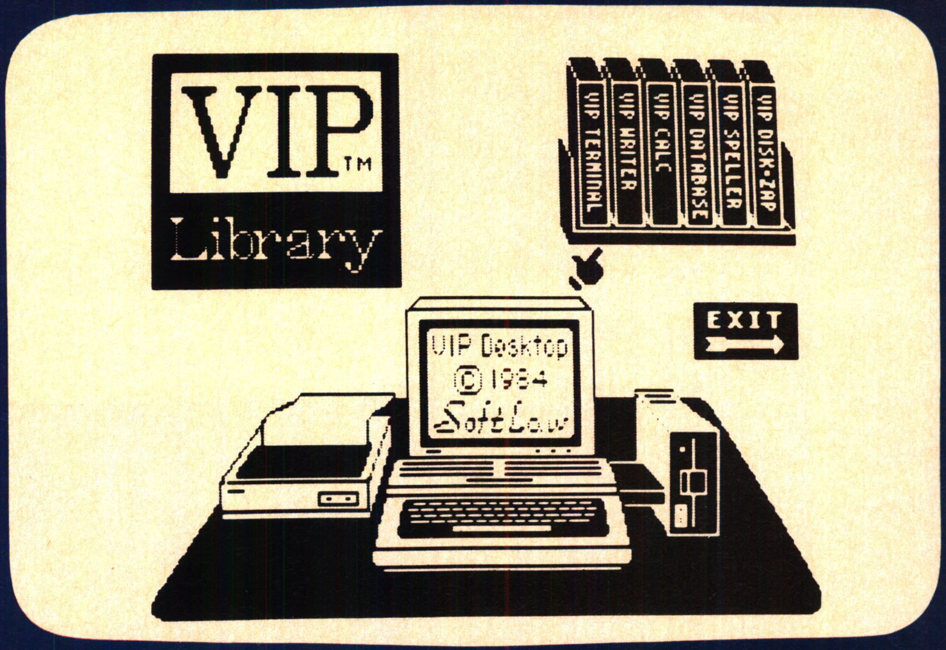
There are three parts to an SCR. The anode, the cathode and the gate. As you can see by the diagram, it doesn't look like more than a diode with another wire going to it. Well, that's basically what it is. The main part of it is a diode, but this diode does not conduct in any direction. It is an open circuit capable of withstanding rated voltage until triggered. That is where the gate comes in. When a small current is applied to the gate, the current path of the diode part of the SRC becomes low-impedance in one direction and remains so, even after the trigger source current is removed. It will remain so until current through the path stops or is reduced below a minimum "holding" level. An SCR is useful for DC and half-wave AC applications.

Figure 2 shows the diagram of a triac. It looks just like two SCR's back to back. In fact, a triac is nothing more than a bidirectional thyristor. A single trigger source turns the device on for load current in either direction. Since they conduct in both directions, triacs are useful in AC power applications that require full source power control capability to be applied to the load. This capability is what we need in this project. In short, a triac can be described as an electronic switch. It can also be used as a variable control switch, but that capability will not be used in this project.

The Radio Shack Optocoupler is a special type of triac device. Instead of the normal gate controlled trigger, it has an optoisolator device connected to the gate. This is important to us because high voltage like the AC coming from the wall is very dangerous to a low voltage computer. Even the slightest spike of noise can destroy a computer. The optoisolator part of this device will protect the high voltage from coming close to your computer. Only one problem, the current handling capabilities of this device is too limited to be useful. So we'll use it to trigger the gate of a more powerful triac. The triac, in series with a load (our lights) and the AC from the wall, will complete a circuit. Before, I told you that a triac is an electronic switch. With the right signal to the Optocoupler, we can control the load

(Tony DiStefano is well known as an early specialist in computer hardware projects. He lives in Laval Ouest, Quebec.)

Direct a Symphony™ on Your Color Computer



with VIP Integrated Library™

VIP Desktop Magic!

Finally, you can have the power and integration of Lotus Symphony™, 1 2 3™ or Open Access™ for the larger micros on your Color Computer! The convenience of instant changes to a new application and effortless transfer of files is at the tip of your finger.

With VIP Desktop, the six applications of VIP Library are integrated into one program, on one disk. You have instant access to word processing, with a spelling checker always in attendance, data management with mail merge, spreadsheet financial analysis, telecommunications and disk maintenance. Just move the hand to point to the volume, and the new application is there. And VIP Integrated Library has been made to work well with one disk drive, or all four, so be ready to push your Color Computer to the limits!

Available By Express Order At Your Local Radio Shack® Store!

Ask to see the demonstration diskette.

". . .PICTURE getting your instantaneous investment report with your modem, using it in a spreadsheet calculation, making a report, and writing a memo including that report and data from your database with your word processor - all this power without leaving VIP Desktop! . . ."

Elegance!

VIP Integrated Library is a product with finesse, inside and out. Inside is one awesome but very elegant program. On the outside, it comes handsomely bound in two cloth covered, gold embossed binders with slipcases - like those you get with software for the Tandy 2000™. And remember, to get software of this quality for the Tandy 2000 you would have to pay hundreds more!

Buy the Integrated Library for

$149.95

Or buy the individual volumes separately, as shown on the following pages!†

Stand-Alone Power

VIP Integrated Library is not one of those slip-shod, all-in-one slicer-dicer machines, good for one day and then you throw it away. It fully integrates the six top-of-the-line stand-alone programs described in the following pages: VIP Writer, VIP Speller, VIP Calc, VIP Database, VIP Terminal & VIP Disk-ZAP. You can buy the entire Integrated Library at once, or you can buy one or two programs that you need now and upgrade to the integrated Library later.†

Shared Files, Shared Features

All VIP Integrated Library applications share common features, such as ease of use, built-in help, the same commands, full printer control, full use of your 64K of memory, and step-by-step tutorials. Most important, all essential applications feature professional high resolution lowercase displays to give you a choice of 51, 64, or 85 characters per line, with 21 or 24 lines per screen. You get a professional display on your Color Computer without any hardware modification!

Requires 64K and one or more disk drives.
VIP Integrated Library comes on one disk. Tape versions of programs are not supplied.

†Those already owning one VIP product, except for VIP Speller, may purchase the Integrated Library by sending in the VIP program with a check or money order for $99.95. This upgrade offer is limited to one Library per person; credit will ONLY be given for one VIP program, regardless of how many are owned. This upgrade offer is available ONLY through Softlaw, and not through Radio Shack stores or dealers.

Radio Shack is a registered trademark of Tandy Corp.
Tandy 2000 is a trademark of Tandy Corp.
Symphony and 1 2 3 are trademarks of Lotus Corp.
Open Access is a trademark of Software Products International.

VIP Writer™

Includes VIP Speller at no additional cost!!

By Tim Nelson

RATED TOPS IN RAINBOW
COLOR COMPUTER MAGAZINE & COMPUTER USER

The most powerful and easy-to-use word processor is available in the showpiece and workhorse of the **Library: The VIP Writer™**.

The result of two years of research, the **VIP Writer™** offer every feature you could desire from a word processor. It is the most powerful, fastest, most dependable and most versatile. With the hi-res display, workspace and compatibility features built into the **Library** the **Writer** is also the most usable.

". . . Nearly every feature and option possible to implement on the Color Computer. The design of the program is excellent; the programming is flawless." October 1983 "Rainbow"

"Among word processors for the CoCo, VIP Writer stands alone as the most versatile, most professional program available." May 1984 "Computer User"

The **Writer** will work with you and your printer to do things you always wanted to do. Every feature of your printer can be put to use, every character set, every graphics capability at any baud rate, EVEN PROPORTIONAL SPACING. All this with simplicity and elegance. You can even automatically print multiple copies.

Although all versions feature tape save and load, the disk version provides the Mini Disk Operating System common to the whole **Library**, plus disk file linking for continuous printing.

Professional features of particular note:

- Memory-Sense with **BANK SWITCHING** to fully utilize 64K, giving not just 24 or 30K, but up to 53K of workspace with the tape version and 50K with the disk version.
- TRUE FORMAT WINDOW allowing you to preview the printed page ON THE SCREEN BEFORE PRINTING, showing centered lines, headers, FOOTNOTES, page breaks, page numbers, & margins in line lengths of up to 240 characters. It makes HYPHENATION a snap.
- A TRUE EDITING WINDOW in all 9 display modes for those extra wide reports and graphs (up to 240 columns!).
- FREEDOM to imbed any number of PRINTER CONTROL CODES anywhere, **EVEN WITHIN JUSTIFIED TEXT**.
- Full 4-way cursor control, sophisticated edit commands, the ability to edit any BASIC program or ASCII textfile, SEVEN DELETE FUNCTIONS, LINE INSERT, LOCATE AND CHANGE, wild card locate, up to TEN SIMULTANEOUS block manipulations, word wrap around, programmable tabs, display memory used and left, non-breakable space, and headers, footers and FOOTNOTES.
- Automatic justification, automatic pagination, automatic centering, automatic flush right, underlining, superscripts, subscripts, pause print, single-sheet pause, and print comments.
- Type-ahead, typamatic key repeat and key beep for the pros, ERROR DETECTION and UNDO MISTAKE features, 3 PROGRAMMABLE functions, auto column creation, and instant on-screen HELP.

Radio Shack Catalog No. 90-0141
32K (Comes with tape & disk) $69.95
VIP Writer — VIP Speller Combo comes in VIP Writer Binder.

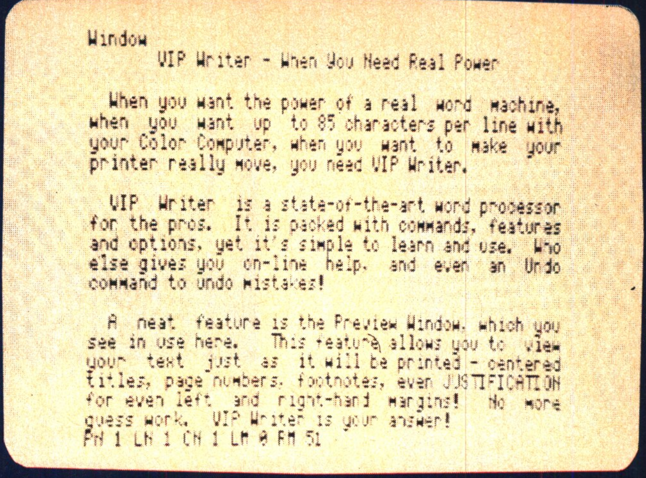
VIP Speller™

WITH A 50,000 WORD INDEXED DICTIONARY!

By Bill Argyros

Gone are the eyestrain, boredom and fatigue from endless proofreading. **VIP Speller™** is the fastest and most user-friendly speller for your CoCo. It can be used to correct any ASCII file — including **VIP Library™** files and files from **Scripsit™** and **Telewriter™**. It automatically checks files for words to be corrected, marked for special attention or even added to the dictionary. You can even view the word in context, with upper and lowercase. **VIP Speller™** comes with a specially edited 50,000 word dictionary which, unlike other spellers for the CoCo, is indexed for the greatest speed. The shorter your file, the quicker the checking time. And words can be added to or deleted from the dictionary or you can create one of your own. **VIP Speller™** also comes with the **Library's** mini disk operating system.

Radio Shack Catalog No. 90-0142
32K DISK ONLY $49.95
Hi-Res Lowercase displays not available on this program.



```
Window
      VIP Writer - When You Need Real Power

  When you want the power of a real  word  machine,
when  you  want  up  to 85 characters per line with
your Color Computer, when you  want  to  make  your
printer really move, you need VIP Writer.

  VIP  Writer  is a state-of-the-art word processor
for the pros.  It is packed with commands, features
and options, yet it's simple to learn and use.  Who
else gives you  on-line  help.  and  even  an  Undo
command to undo mistakes!

  A  neat  feature is the Preview Window. which you
see in use here.   This feature allows you to  view
your  text  just  as  it will be printed - centered
titles, page numbers, footnotes, even JUSTIFICATION
for even left  and  right-hand  margins!   No  more
guess work.  VIP Writer is your answer!
PN 1 LN 1 CN 1 LM 0 RM 51
```

VIP Calc™

By Kevin Herrboldt

You can forget the other toy calcs — The real thing is here! No other spreadsheet for the Color Computer gives you:

- **20 ROWS BY 9 COLUMNS ON THE SCREEN AT ONCE**
- **LOWERCASE LETTERS WITH DESCENDERS**
- **UP TO 16 CONCURRENT DISPLAY WINDOWS**
- **FLOATING-POINT MATH**
- **CHOICE OF SINGLE AND DOUBLE PRECISION**
- **WORKS WITH BASE 2, 10, AND 16 NUMBERS**
- **UP TO 512 COLUMNS BY 1024 ROWS**
- **USER DEFINABLE WORKSHEET SIZE FOR MORE MEMORY**
- **LOCATE FUNCTION TO FIND CHECK NUMBERS, NAMES, ETC.**
- **COLUMN/ROW MULTIPLE SORTS**
- **PROGRAMMABLE FUNCTIONS**
- **IMBEDDABLE PRINTER CONTROL CODES**
- **21 ALTERABLE PRINT FORMAT PARAMETERS**
- **ON-LINE HELP TABLES**
- **DOES NOT REQUIRE FLEX OR BASIC**

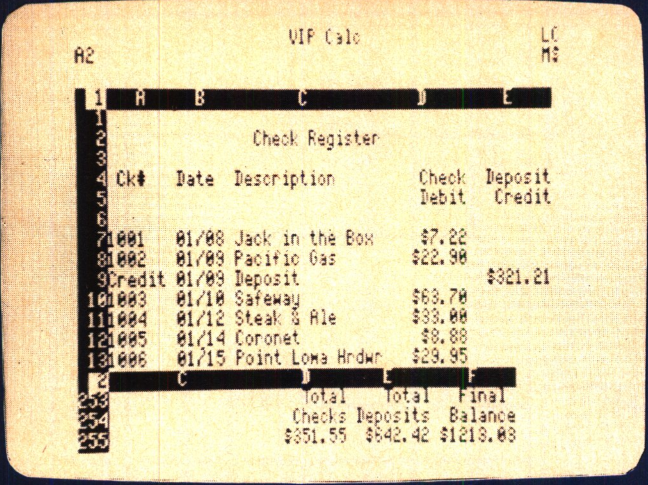
VIP Calc™ is truly the finest and easily the most powerful electronic worksheet and financial modeling program available for the Color Computer. Now every Color Computer owner has access to a calculating and planning tool better than VisiCalc™, containing all its features and commands and then some, WITH USABLE DISPLAYS. Use Visicalc templates with **VIP Calc™!**

There's nothing left out of **VIP Calc™**. Every feature you've come to rely on with VisiCalc™ is there, and then some. You get up to **5 TIMES** the screen display area of other spreadsheets for the Color Computer and Memory-Sense with **BANK SWITCHING** to give not just 24, or 30, but **UP TO 33K OF WORKSPACE IN 64K!!!** This display and memory allow you the FULL SIZE, USABLE WORKSHEETS you require. You also get: User definable worksheet size, up to 512 columns by 1024 rows! * Up to **SIXTEEN VIDEO DISPLAY WINDOWS** to compare and contrast results of changes * **16 DIGIT PRECISION** * Sine, Cosine and other trigonometric functions, Averaging, Exponents, Algebraic functions, and **BASE 2, 8, 10 or 16** entry * Column and Row, Ascending and Descending **SORTS** for comparison of results * **LOCATE FORMULAS OR TITLES IN CELLS** * Easy entry, replication and block moving of frames * Global or Local column width control up to 78 characters width per cell * Create titles of up to 255 characters per cell * Limitless programmable functions * Typamatic Key Repeat * Key Beep * Typeahead * Print up to 255 column worksheet * Prints at any baud rate from 110 to 9600 * Print formats savable along with worksheet * Enter PRINTER CONTROL CODES for customized printing with letter quality or dot matrix printer * Combine spreadsheet tables with **VIP Writer™** documents to create ledgers, projections, statistical and financial reports and budgets. Both versions feature Tape save and load, but the disk version also has the Mini Disk Operating System of the entire **Library.**

Radio Shack Catalog No. 90-0143

32K (Comes with tape & disk) $69.95

32K does not have hi-res displays, sort or edit



```
                  VIP Calc                        LC
A2                                                M$

 1    A       B            C              D       E
 1
 2                  Check Register
 3
 4 Ck#    Date  Description            Check  Deposit
 5                                     Debit   Credit
 6
 71001   01/08 Jack in the Box         $7.22
 81002   01/09 Pacific Gas            $22.90
 9Credit 01/09 Deposit                        $321.21
101003   01/10 Safeway                $63.70
111004   01/12 Steak & Ale            $33.00
121005   01/14 Coronet                 $8.88
131006   01/15 Point Loma Hrdwr       $29.95
 2              C             D        E        F
253                        Total    Total    Final
254                       Checks Deposits  Balance
255                      $351.55  $642.42 $1213.08
```

VIP Terminal™

RATED BEST IN JANUARY 1984 "RAINBOW"

By Dan Nelson

From your home or office you can join the communication revolution. The **VIP Terminal™** opens the world to you. You can monitor your investments with the Dow Jones Information Service, or broaden your horizons with The Source of CompuServe, bulletin boards, other computers, even the mainframe at work.

For your important communication needs you've got to go beyond software that only lets you chat. You need a smart termnal so that you can send and receive programs, messages, even other **VIP Library™** files. **VIP Terminal™** has "more features than communications software for CP/M, IBM and CP/M 86 computers." Herb Friedman, Radio Electronics, February 1984.

FEATURES: Choice of 8 hi-res lowercase displays * Memory-Sense with BANK SWITCHING for full use of workspace * Selectively print data at baud rates from 110 to 9600 * Full 128 character ASCII keyboard * Automatic graphic mode * Word mode (word wrap) for unbroken words * Send and receive **Library** files, Machine Language & BASIC programs. Duplex: Half/Full/Echo, Word length: 7 or 8, Parity: Odd/Even or None, Stop Bits: 1-9 * Local linefeeds to screen * Save and load ASCII files, Machine Code & BASIC programs * Lowercase masking * 10 Keystroke Multiplier (MACRO) buffers to perform repetitive pre-entry log-on tasks and send short messages * Programmable prompt or delay for send next line * Selectable character trapping * Send up to ten short messages (KSMs), each up to 255 characters long, automatically, to save money when calling long distance.

All versions allow tape load and save of files and KSMs, but the disk version also has the Mini Disk Operating System.

Radio Shack Catalog No. 90-0139

32K (Comes with tape & disk) $49.95

(Tape works in 16K but without hi-res displays)

Available By Express Order At Your Local Radio Shack® Store!

Radio Shack is a registered trademark of Tandy Corporation.

VIP Database™

"ONE OF THE BEST" JULY 1984 "RAINBOW"

By Tim Nelson

This high speed MACHINE LANGUAGE program fills all your information management needs, be they for your business or home. And it does so better than any other database program for the Color Computer, featuring machine code, lowercase screens and mailmerge capabilities. Inventory, accounts, mailing lists, family histories, you name it, the **VIP Database™** will keep track of all your data, and it will merge **VIP Writer™** files.

The **VIP Database™** features the **Library** Memory Sense with BANK SWITCHING and selectable lowercase displays for maximum utility. It will handle as many records as fit on your disk or disks. It is structured in a simple and easy to understand menu system with full prompting for easy operation. Your data is stored in records of your own design. All files are fully indexed for speed and efficiency. Full sort of records is provided for easy listing of names, figures, addresses, etc., in ascending or descending alphabetic or numeric order. Records can be searched for specific entries, using multiple search criteria. With database form merge you may also combine files, sort and print mailing lists, print "boiler plate" documents, address envelopes - the list is endless. The math package even performs arithmetic operations and updates other fields. Create files compatible with the **VIP Writer™** and **VIP Terminal™**. Unlimited print format and report generation with the ability to imbed control codes for use with all printers.

As with all other **Library** programs, the **Database** features the powerful Mini Disk Operating System.

Radio Shack Catalog No. 90-0140

32K DISK $59.95

64K Required for math package & mail merge

VIP Disk-ZAP™

RAVED ABOUT IN THE APRIL 1983 "RAINBOW!"

By Tim Nelson

Your database file disk, form letter disk, or BASIC program disk goes bad. An I/O error stops loading, or even backing up of the disk. Weeks, even months of work sit on the disk, irretrievable. Now catastrophic disk errors are repairable, quickly and with confidence, using the **VIP Disk-ZAP™**. It is the ultimate repair utility for simple and quick repair of all disk errors. Designed with the non-programmer in mind, the **VIP Disk-ZAP™** will let you retrieve all types of bashed files, BASIC and Machine Code programs.

This high-speed machine code disk utility has a special dual cursor screen display to look at the data on your disk. You are able to: Verify or modify disk sectors at will * Type right onto the disk to change unwanted program names or prompts * Send sector contents to the printer * Search the entire disk for any grouping of characters * Copy sectors * Backup tracks or entire disks * Repair directory tracks and smashed disks * Full prompting to help you every step of the way * 50-plus page Operators Manual which teaches disk structure and repair.

Radio Shack Catalog No. 90-0144

16K DISK $49.95

Hi-Res Lowercase displays not available with this program.

VISA To Order Direct Call: MasterCard

1-800-328-2737

All Order Status and Software Questions must call (805) 968-4364

MAIL ORDERS: $3.00 U.S. Shipping per product (VIP Library is two products) $5.00 CANADA; $10.00 OVERSEAS. Personal checks allow 4 weeks. All prices subject to change without notice.

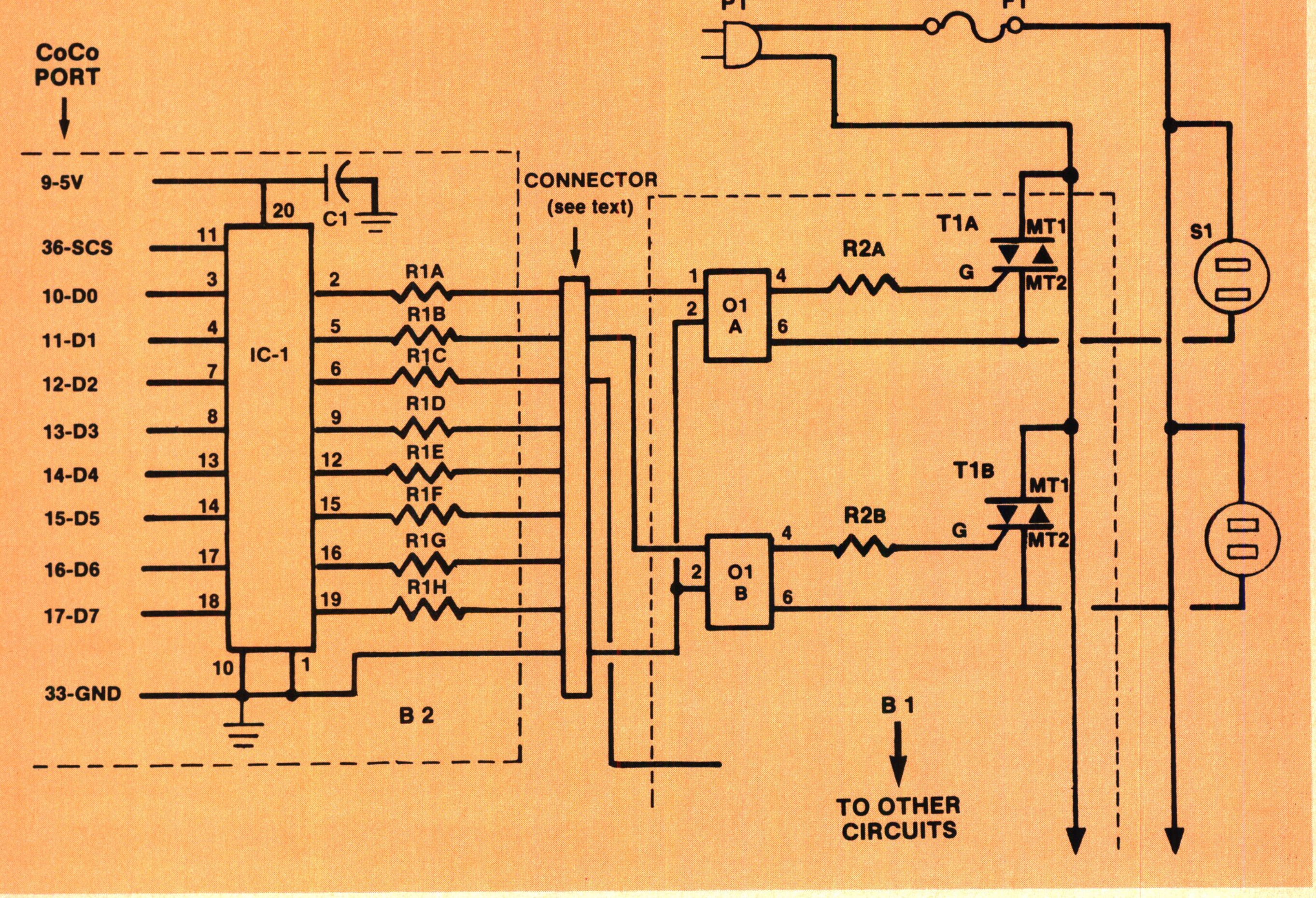
Softlaw

132 Aero Camino
Goleta,
California 93117

TRS-80 is a trademark of Tandy Corp. VisiCalc is a trademark of VisiCorp. All prices subject to change without notice.

1984 by Softlaw Corporation

FIGURE 2



(our lights) on and off.

We now know that the right signal to the Optocoupler can turn our lights on and off. What is the right signal? A small current, say, from a computer, is quite enough. The rest is quite simple. One eight-bit latch to control the Optocoupler and eight resistors and we are off. The rest is just construction. There is a parts list in Table 1.

All the parts that have a quantity of "*" need explanation. You do not need to make all eight of the triac circuit. It all depends on your use. If all you want is a light chaser, then you need only three of each part. If you want to do something more elaborate, you may want to construct all eight of the triac circuits. The maximum is, of course, eight. More is possible but requires more circuitry. I don't think there is the need for more, but if there is, write to me for details. As it is, the eight-bit latch is memory-mapped at $FF40 (65433 in decimal), so the use of this with a disk drive is impossible unless you have one of the expansion interfaces available on the market.

Table 1
Parts List

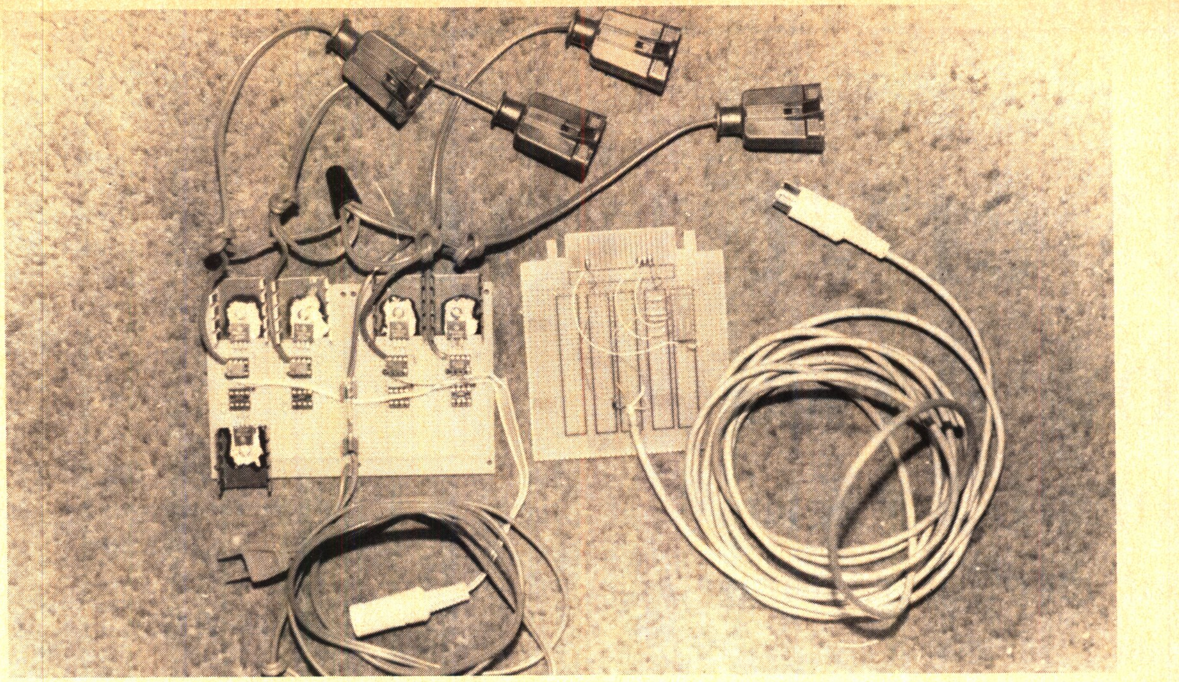
ID	Quantity	Description	Available At
IC-1	1	74LS374	Electronics Store
C1	1	.1 UF 25WVDC	RS
F1	1	10 amp Fuse & holder	RS
R1	*	220 ohms ¼w	RS
R2	*	150 ohms ¼w	RS
O1	*	Optocoupler	RS #276-134
T1	*	Triac	RS #276-1001
H1	*	Heatsink	RS #276-1363
S1	*	AC socket	Hardware Store
P1	1	AC Plug	Hardware Store
B1	1	Proto-Board Main-Board	RS #276-161
B2	1	Proto-Board Computer-Side	R.G.S Micro

Misc.: Wire, connectors, sockets, solder, mounting hardware, plastic project box.

This project is basically in two parts. The first part is the computer side. The only parts that go on the proto-board (B2) are the latch, resistors and the capacitor. What will leave this board is a ground wire and one wire for every triac circuit you need. You may connect the two boards together directly or use a connector. What connector you use depends on how many wires you use. Refer to the Radio Shack catalog for the right connector.

The second part of the project is the main board (B1). It consists of all the remaining parts. There is enough room on the board to fit all eight triac circuits. There is not much to this part, just examine photo 1 for placement of all the parts and follow the circuit.

Before trying this, you should run a few tests. Plug in all the ICs except the 74LS374. Plug in the control box and the lights. None of the lights should be on. If some or all of the lights are on, turn everything off and check your work. Next, take a little piece of wire and jumper pin 20 to pin 3, 4, 7, 8, 11, 12, 15, 16 — one at a time. As you do



this each light should go on. If this is OK, turn everything off and plug in the last chip. To see if all is OK, turn everything on. All the lights should be off. Type *POKE &HFF40,255*, or *POKE 65433,255*. The *65433 (&HFF40* in Hex) is the control byte. The lights should go on. *POKEing* a zero into the same location should turn the lights off. The short listings provided will give you an example of what you can do with the lights.

The last step is how to control each light separately. *POKEing* a zero into the control byte will turn off all the lights. Each of the eight lights is controlled by one bit. The first bit controls the first light, the second bit controls the second light, and so on.

Table 2 shows the decimal value of each light. To have any light on, just poke the decimal value of the light number into the control byte. If you want more than one light on, you must add the decimal values of each light. Example, if you want light 2 and light 6 on, you must do 2 + 32 = 34. *POKE 34* into the control byte. I wrote a little program in BASIC to give you an example of what you can do with these lights.

Table 2

POKE value	Light to turn on
1	1
2	2
4	3
8	4
16	5
32	6
64	7
128	8

There are a few things to remember, though. Each individual triac circuit load (light or set of lights) must not exceed 400 watts and the total power must not exceed 1200 watts. To get the chaser effect, you need just three triac circuits and three sets of lights. Arrange the lights in parallel and tie them together so that the sequence of lights goes 1, 2, 3 . . . 1, 2, 3 . . . 1, 2, 3. *RUN* the chaser program and, there you have it.

It has been brought to my attention that there seems to be a problem with my parallel printer adapter. The problem is with the grounding of pin 18. While on my Epson printer, I have no problems, on most printers there is a positive voltage on this pin. Connecting this in to ground can cause damage to the printer. To solve this do not ground pin 18 in the output connector.

"Tape Tamer" (T.UTIL) and "A Snappy Zapper" (DAPPER) by Sadare Software

T.UTIL

Appends • Indexes • Copies • Verifies

. . .I haven't seen any tape utility that can compare to T.UTIL. Rainbow, *June 1984* *Only* $12.95

DAPPER

Allows complete control of disk system.

. . .I highly recommend DAPPER *. . .performed flawlessly . . .It's a winner!* Rainbow, *October 1984* $14.95

ROM Runner–Allows *any* ROM pack-based program to run from tape or disk. Requires 64K and a cassette drive. Easy-to-use. $7.95

Library 1–The ultimate productivity tool for all Color EDTASM users. Requires 32K, a disk drive and disk EDTASM. *Priced at only* $24.95

MDCOPY/NODISK–ease the transition from tape to disk. *Both for only* $9.95

***DISCOUNTS** on brand-name disks*–**send for price list!**

COMPARE PRICE & PERFORMANCE

RAINBOW CERTIFICATION SEAL

Sadare Software programs are Rainbow-certified.

Sadare Software
P.O. Box 3891
Gaithersburg, MD 20878

Please send the following. Check/money order enclosed.

	Price
T.UTIL	______
DAPPER	______
ROM Runner	______
Library 1	______
MDCOPY/NODISK	______
Postage & Handling	$1.50
TOTAL	$ ______

Name ____________
Address ____________
City State Zip
Please send: ☐ free catalog ☐ disk price list

Mail to: Sadare Software
P.O. Box 3891, Gaithersburg, MD 20878
Maryland residents add 5% sales tax.

64K
Disk

Everything You Always Wanted To Know About The Color Computer

But Radio Shack Didn't Tell You

This is part five in a series concerning various aspects of the Color Computer

New Revisions In CoCo's ROM

By Andy Kluck

In response to a lack of information from Radio Shack on the newest revisions of the CoCo's ROMs and the bugs in the old ROMs they replace, I have compiled this article to explain the major differences between them. Also included is a utility program for use in 64K systems for installing any set of BASICs in RAM from files. Numbers in parentheses are approximate addresses of some of the ROM changes.

Color BASIC 1.1

The most important difference between Color BASIC 1.0 and 1.1 is that the Reset routine ($A027-$A06D or -$A073 in 1.1) of 1.1 has the added ability to detect the 64K RAM jumper and properly initialize the SAM to use 64K RAMs. In order to make room for the extra code required to make this test, the initialization routines ($A06E, or $A074 in 1.1 through $A0CA) have been largely rewritten. The keyboard scan routine ($A1C1-$A26D) has also been rewritten to prevent the joystick buttons from causing a string of false characters to be detected. The printer driver ($A2C5-$A2FA) has been modified to send eight bits per character instead of seven. A bug ($A440) in the CLOSE routine for output files that prevents writing of the end of file mark for files with lengths that are integer multiples of 255 has been fixed. Because of this problem, reading such a sequential file (of length 0, 255, 510, etc. bytes) written by Color BASIC 1.0 causes the computer to keep searching for the next record past the end of the file. However, Extended BASIC 1.0 and 1.1 both fix this bug using a RAM hook, so only BASIC 1.0 without Extended BASIC causes this problem. Finally, an error ($A6EB) has been fixed to allow for visible blinking of the corner of the screen during *SKIPFing* of ungapped files, such as those made by *CSAVE* and *CSAVEM*.

The major incompatibility problem caused by these changes is that the few programs using the keyboard scan routine to detect the joystick buttons may now require certain keys on the keyboard to be used instead.

Color Basic 1.2

The major change made in the 1.2 BASIC ROM is that the routine that tests for the BREAK and Shift @ keys before each BASIC statement ($A1C1-A26D) is executed now scans the keyboard only if at least one key is held down. This results in faster execution of BASIC programs whenever no keys or joystick but-

---

(Andy Kluck is an electrical engineering student at the University of Texas at Austin.)

FOUR HOT UTILITIES FOR THE COLD MONTHS

DISK ANTI-PIRATE

(A Breakthrough in Disk Protection)

Your Only Weapon Against Software Piracy!

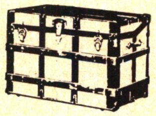
Here is a chance for you to copy-protect your Basic and ML programs. DISK ANTI-PIRATE does more than any other program in the market. Compare the features:

- ★ Auto starts your Basic/ML programs.
- ★ Effectively encrypts your programs.
- ★ Disables BREAK/CLEAR KEY, RESET BUTTON.
- ★ Modifies your code so LIST, LLIST, POKE, PEEK, EXEC, USR, CSAVE (M), CLOAD (M), EDIT, DEL, TRON, TROFF, SAVE (M), LOAD (M), MERGE will ONLY work with your own PASSWORDS.
- ★ Your Basic program loads with LOADM.
- ★ Includes a Title Screen Editor to create title screens, which can be displayed while your program loads.
- ★ 'ONERR GOTO' feature to trap errors (even for ML programs).
- ★ Can be used to turn on 64K ALL-RAM MODE in 32K/64K memory systems.
- ★ EASY-TO-USE and FULL DOCUMENTATION.
- ★ NO ROYALTIES/AGREEMENTS/CONTRACTS.

MIN. 16K ECB Disk System.
(Works with CoCoI and CoCoII)
ONLY $59.95

HIDE-A-BASIC 1.1

(A Breakthrough in Cassette Protection)



AT LAST! A program that combines autostart with complete protection of your valuable Basic programs.

IMPORTANT FEATURES:

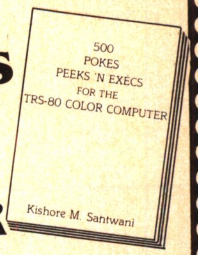
- Autostarts your programs.
- A ML program that modifies your program and NOT just 'Stands Apart'.
- Option to disable Break-key, Clear key & Reset button.
- Disables LIST, LLIST, EDIT, DEL, TRON, TROFF, CSAVE (M), CLOAD (M).
- Disables POKE, PEEK, EXEC & USR to prevent 'Back-door entry' to your program.
- Disables disk functions to avoid access thru Disk System.
- Creates an 'ONERR GOTO' routine to trap errors.
- Your Basic program is loaded as a ML program - with CLOADM.
- Full documentation.

WITH HIDE-A-BASIC 1.1 THERE IS PRACTICALLY NO WAY ANYONE CAN 'GET INTO' YOUR PROGRAM.

Buy Now & Protect your Profits. For 16K ECB Cassette System.
Tape Only $24.95.

Buy BOTH for ONLY $79.95.

500 POKES, PEEKS 'N EXECS for the TRS-80 COLOR COMPUTER



NEVER BEFORE has this information of vital significance to a programmer been so readily available to everyone. This book will help you 'GET UNDERNEATH THE COVER' of the Color Computer and develop your own HI-QUALITY programs, SO WHY WAIT?

This 80-page book includes POKEs, PEEKs and EXECs to:

- ★ Autostart your Basic programs.
- ★ Disable most Color Basic/ECB/Disk Basic commands.
- ★ Disable BREAK KEY, CLEAR KEY and RESET BUTTON.
- ★ Generate a Repeat-Key.
- ★ Merge two Basic programs.
- ★ Transfer Rompaks to tape (for 64K only).
- ★ Speed up your programs.
- ★ RESET, MOTOR ON/OFF from keyboard.
- ★ Restart your Basic program thru the RESET BUTTON.
- ★ Produce Key-Clicks and Error-Beeps.
- ★ Recover Basic programs lost by NEW, ?IO ERRORS and faulty RESET.
- ★ Set 23 different GRAPHIC/SEMIGRAPHIC modes.
- ★ Set 15 of the most commonly used Baud Rates.
- ★ Allow you more plays in 23 of your favorite arcade games.
- ★ AND MUCH MUCH MORE!!!

COMMANDS COMPATIBLE WITH 16K/32K/64K COLOR BASIC/ECB/DISK BASIC CASSETTE and DISK SYSTEMS and CoCoI and CoCoII.

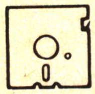
ONLY $16.95

ALPHA-DIR

This program will help you arrange your DISK directories in an alphabetical order. Keeps disks in order and allows easy access to programs. Displays Granules and Bytes used on disk.

DISK **$14.95**

DISKETTES



5¼" SS/DD Diskettes with tearless sleeves, hub rings, write-protect tabs, and Jackets.

QUANTITY	PRICE	SHIPPING
1	$1.95	$2.00
10	$16.95	$2.00
100	$162.95	$7.00

NO SHIPPING charges on disks if ordered with any other software.

MICROCOM SOFTWARE No. ________
GIFT CERTIFICATE
Pay to the order of ________ $ ________
Amount ________
Memo ________
available in any amount!

MICROCOM SOFTWARE
P.O. BOX 214, FAIRPORT, N.Y. 14450

MasterCard VISA

To Order: VISA, MC, CHECK, MO, COD ($2.50 extra) Please add $2.00 shipping and handling (Foreign $5.00). NYS Residents, please add Sales Tax. • Immediate shipment • Order by phone and get a $2.00 refund for your phone call • Call for discounts on bulk quantities • Dealer inquiries invited

24-HOUR ORDER HOT LINE: (716) 223-1477

tons are down. The speed increase may range from a few percent in programs with lots of slow instructions to 200 percent in programs like:

```
10 FOR A=0 TO 1000::::::::::NEXT
```

In order to implement this, the keyboard scanner has been compressed, and its entry point referenced by the vector at $A000 has moved from $A1C1 to $A1CB. There are also some minor changes. The 1.2 printer output routine ($A2C3-$A2FA) waits for a ready signal from the printer before and after sending each character instead of only making this test after sending like the earlier ROMs. This prevents the loss of one character that may otherwise have been outputted before the printer was ready. Also, the initial Baud rate constant ($A114) has been changed from 87 to 88, apparently in an attempt to more closely approximate the correct Baud rate.

> ***"The most important difference between Color BASIC 1.0 and 1.1 is that the Reset routine ($A027-$A06D or -$A073 in 1.1) of 1.1 has the added ability to detect the 64K RAM jumper and properly initialize the SAM to use 64K RAMs."***

A new patch ($B23F) prevents a syntax error when a Hex or Octal constant is preceded by a plus sign with Extended BASIC installed *PRINT + &H20* incorrectly gives an error in the "get operand" routine has been patched ($B3ED-$B426) to give a TM Error when a string is used as the argument for some functions that should require numeric arguments. For example, *CLEAR: PRINT EOF(A$),CHR$(A$)* gives no error in Color BASIC 1.0 and 1.1. Finally, the floating point bug ($B9D6) has been fixed so that CoCo no longer thinks that *PRINT 1000 + 1E-38 'Correct answer is 1000* is 1E-38. Watch out for programs that call the keyboard scanner directly at $A1C1 instead of through the vector at $A000. In revision 1.2, $A1C1 is the address of the routine which quickly tests the keyboard and then scans the keyboard normally only if at least one key is held down or otherwise clears the A register and returns. Therefore, machine language programs that call $A1C1 to scan the keyboard may work normally except that they do not accept any keyboard character twice in a row, because the rollover table is not updated between key presses. For the same reason, BASIC programs, which test the keyboard rollover table at $152-159 to detect which keys are pressed (a technique which has been referred to as "auto repeat"), may receive a false indication that a key is being held down after it has been released, until another key or joystick button is pressed. For example, this routine tests if the 'Q' key when held down keeps printing the message after the 'Q' is released until another key is pressed in Color BASIC 1.2:

```
10 IF (PEEK(&H153) AND4)=0
THEN ?"Q DOWN"ELSE CLS
20 GOTO 10
```

Extended Basic 1.1

The most important change in Extended BASIC 1.1 is that *PCLEAR* has been patched ($96A3-$96B3, $80D0-$80DD) to work properly inside a program. Also, *PRINT USING* has been patched ($9179, $917D) so that numbers printed in exponential format with exponents greater than nine are not botched up as in Extended BASIC 1.0. Another patch ($8C1B-$8C22, $8C51) fixes *DLOADM;* under Extended BASIC 1.0 without Disk BASIC, it didn't work at all.

Finally, *PMODE*($962C-$962D) now tests location $BC to find the correct start of graphics page one instead of assuming it is $600; this was not a major problem, since $600 is always the start of page one except with Disk BASIC, which fixes *PMODE* by itself through a RAM hook. The most likely problem caused by the changes is with programs that use a *PCLEAR 0* routine that calls the ROM's *PCLEAR* routine in the area $96A5-$96B3, which has been rewritten; such routines need to be replaced with an equivalent designed to work with either ROM.

Disk Basic 1.1

First of all, Disk BASIC 1.1 adds a new interpret loop ($C8B0-$C90B in new ROM) through one of the RAM hooks, which has the effect of speeding up execution in the same way as Color BASIC 1.2, so that a system with either one or both of new ROMs will run at the increased speed. *GET, PUT,* and *LOC* have been modified to work with record numbers up to 65535 instead of just 32767. Extra error checking has been implemented in some places, and most of the bugs in the close routine for random files have been fixed. Closing random files in any order other than last-opened, first-closed caused a system crash in Disk BASIC 1.1, and this has been fixed ($CB93-$CBB1 in new ROM); however, a similar crash in the close routine after an I/O Error while the file is open during COPY has not. This last problem will probably require major patches in COPY, CLOSE, or both to fix. In Disk BASIC 1.1, closing a random file no longer ($CACB in old, $CB80 in new) deletes strings fielded in buffers other than the one being closed.

> ***"There is an error in the Disk 1.0* DSKINI *routine . . . [which] is fixed by an instruction at $D5F1-$D5F2 in the new ROM . . .***

Also, in the old ROM, string array elements fielded in any random buffer while any random file is being closed may have their descriptor addresses messed up, causing general confusion, and this has been fixed ($CA8C-$CAD5 in old, $CB3D-$CB88 in new) in revision 1.1. The bug in FILES that was analogous to the *PCLEAR* bug has been fixed (new code at $D1E2-$D1EE), along with the one (new code at $D1A8-$D1AE) that sometimes causes FILES to allocate the beginning of graphics area to an odd page where the SAM could not display it. Also, in Disk BASIC 1.0 the FILES statement reserved one more byte for random file buffers than was requested; *FILES*

2,200 would allow a random file to be opened with a record length of 201; this is corrected (instruction at $D0AB-$D0AC in old ROM removed) in revision 1.1. A bug that could bite (byte?) multi-drive systems causing wrecked file allocation tables after files are written on one drive while files are opened on the next higher drive (wrong index in instruction at $C70C-$C70D in old ROM) has been fixed. Also, in Disk BASIC 1.1, the prompting string in the statement *INPUT #DN,"INPUT NUMBER"; N$* is ignored (by new code $C860-$C887) unless DN is 0, in which case it is printed to the screen. The old Disk BASIC would have printed "INPUT NUMBER" into the random file buffer, if DN were an open random file. A new command, DOS (main routine , $DF00-$DF4B) has been added, which loads all of track $22 (34) from drive 0 starting at address $2600 and jumps to $2602 if the characters in $2600-2601 are "OS." DOS appears to have been implemented by Radio Shack instead of Microsoft, and is not well-written; depending on various circumstances, DOS may erase part of the BASIC program, variables, stack (causing a crash), or strings before testing for "OS" to see if the disk is even bootable.

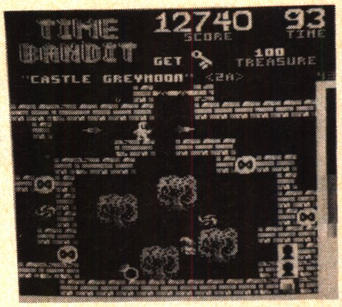
For what it's worth, DOS may be called from machine language by *JMP [$C00A]* using a vector new to Disk BASIC 1.1. There is also a new vector at $C008, called during initialization, which points to a routine ($DF4C-$DF58) that sets the RAM vectors for SW12 and SW13 to RTIs; for some unknown reason a SW13 is used at the beginning of the DOS routine. The SW12 and SW13 to RTIs; for some unknown reason a SW13 is used at the beginning of the DOS routine. The warned users to press Reset after each *DSKINI* command when doing more than one disk at a time to ensure proper formatting. There is an error in the Disk 1.0 *DSKINI* routine which causes the write-precompensation flag of the disk controller, which is supposed to be set only for track numbers greater than 21, to be set while formatting all tracks if *DSKCON's* track register is set greater than 21 when *DSKINI* is executed, possibly causing I/O Errors. This which is fixed (by an instruction at $D5F1- the new ROM, and it appears to be what Radio Shack was referring to, although the description doesn't exactly match the problem. The error does not only occur when *DSKINI* is used more than once; it can happen any time when the last sector read was on a track greater than 21; and besides, pressing Reset doesn't prevent the problem, because it doesn't change the track register. However, doing a *DIR* of any drive, or a *POKE &HEC,0* before each *DSKINI*, will. There are also changes in other parts of the ROM that I wasn't able to analyze which may suggest other problems in the old ROM. Because the ROM has been completely reassembled, all useful routines have been moved, including *DSKCON*. Therefore, most programs that call any Disk ROM routines except *DSKCON* through the vector at $C004 won't work with Disk BASIC 1.1. This does not necessarily mean that such programs are obsolete with the new ROM if they will run in the 64K RAM mode, since this allows the user to install the old Disk BASIC in RAM.

> ***"The most annoying problem that should have been fixed but wasn't, is Disk BASIC's lack of a suitable method of synchronizing the disk head of each drive when it is first used."***

What They Didn't Fix

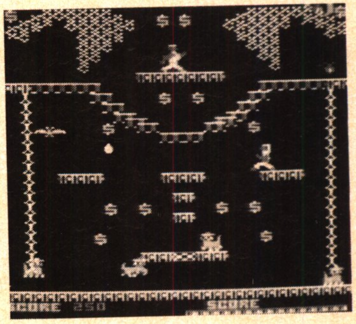
The most annoying problem that should have been fixed but wasn't, is Disk BASIC's lack of a suitable method of synchronizing the disk head of each drive when it is first used. The current software just assumes that each one is at track zero, and if this isn't correct, *DSKCON* attempts to read the wrong track before finding the correct position. If the head position is initially inside of track 17, it results in ramming the mechanism against the inside stops, often knocking the drive so far out of alignment that the head must be synchronized to track zero two times before it finds the directory. The right way would be to initially set the track counter of each drive to some out of range value, and have *DSKCON* upon finding this value either synchronize the drive to

MichTron



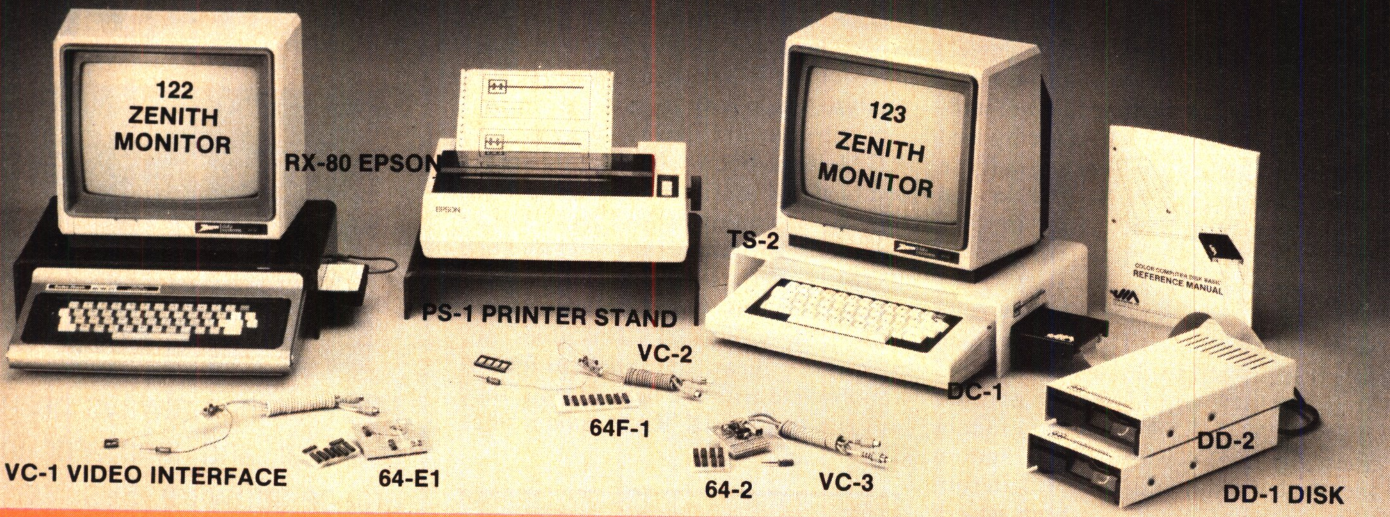
Michtron has always been a leader and innovator in arcade software. First was **CASHMAN,** with 47 different screens, Then came **TIME BANDIT** which many say is the best game ever written for the COCO. Now comes **SPEED RACER! SPEED RACER** is a super car race game written in the POLE POSITION™ type of arcade game. It has unbelievable scrolling 3D graphics! Unconditionally guaranteed to be the finest car race game ever written for the COCO.

All three games are available now for only $34.95 ea. Disk or Tape 32K.



576 South Telegraph
Pontiac, Michigan 48053
(313) 334-6576

Zenith Monitor Special . . . Only $98



ZENITH MONITORS

Our Zenith monitors offer you great quality and high resolution, and our 123 Zenith Green Screen is an outstanding value at only $98. (Note: All monitors require video controller.)

122 Zenith 12″ Amber Screen, 640 dots × 200 dots, 15 MHz resolution. **$134** ($6 shpg)

SPECIAL! 123 Zenith 12″ Green Screen, 640 dots × 200 dots, 15 MHz resolution. Our reg. price $114. **Now only $98.** ($6)

131 Zenith 13″ Color Monitor with speaker, composite, RGB jack. 240 × 200 dots, 2.5 MHz resolution. **$334** ($9)

CONTROLLERS

DC-1 Disk Controller reads and writes to 35 and 40 track single and double sided drives with all models of the color computer. (J&M) **$134** ($2shpg)

VC-1 Video Interface mounts inside color computer by piggybacking IC on top of interface–no soldering, no trace cuts. All models give composite video and sound. **$24.45** ($2)

VC-2 for Color Computer 2–monochrome only. **$26.45** ($2)

VC-3 for Color Computer 2–color and monochrome. **$39.45** ($2)

Payrol/BAS ®
$79.95
See our ad on page 250

MEMORY 64K Upgrades

64-E1 for E Boards. Remove old chips and replace with this preassembled package–no soldering, no trace cuts. **$68.45** ($2)

64-F1 for F Board. Preassembled with no soldering. Capacitor leads must be cut. **$64.45** ($2)

64-2 for Color Computer 2. Kit requires two solder joints, no trace cuts. **$69.45** ($2)

Drive O Packages

More storage, Less cost!

Our double-sided disk package gives you twice the storage for only $44 more . . .

359,424 Bytes:
DD-2 DSDD Drive
DC-1 40 Track Controller
CA-1 Cable

Only
$394
$7 shpg

Our double-sided, double-density disk and 40 track controller give you more available storage at a lower unit cost . . . 359,424 bytes for $394, compared with our major competitor's 156,672 bytes for $350—we give you twice as much storage for only $45 more. Our system will read your old 35 track diskettes, too, and all our Howard Drive O Packages have gold-plated contacts that reduce the common disk errors due to oxidation.

. . . Our single-sided disk package gives you 23,040 bytes more for a dollar less!

179,712 Bytes:
DD-1 SSDD Drive
DC-1 40 Track Controller
CA-1 Cable

Only
$349
$7 shpg

Compare our exceptional prices on high-quality computer equipment and our unmatched 30-day full-refund warranty. Howard value makes our products sensible investments . . . and perfect gifts.

Our Unmatched Guarantee

We offer a 30-day full-refund guarantee on hardware. In addition, all products are covered by manufacturer warranty.

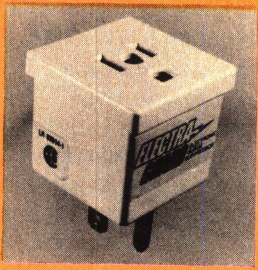
Our Unmatched Service

Charge orders and orders accompanied by money order or certified check are usually shipped within 24 hours. If you're in the Chicago area, you're welcome to stop at our warehouse at 1690 North Elston. Also . . . try calling our Computer Bulletin Board at (312) 278-9513.

SURGE SUPPRESSORS

SS-1 Surge Suppressor protects your data & equipment against power surges and transients. Reg. $48 value.

$16.25 ($2 shpg)



Howard Medical Computers
Box 2, Chicago IL 60690

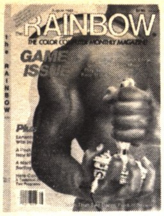
RB1084
Telephone (312) 944-2444
Computer Bulletin Board (312) 278-9513

Cat.No.	Number	Desc. (inc. color)	Unit cost	Cost
			$	$

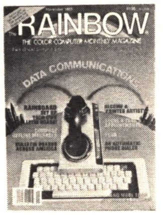
☐ My check or money order is enclosed.
☐ Bill (circle one) MC VISA AE
Credit Card # ____
Expiration date ____
☐ Send C.O.D.

Name ____
Address ____
City, State, Zip ____

Total Cost ...... ____
Shipping .... ____
Ill. res. add 8% ____
COD (add 1.65) ____
Total order ..... $ ____



The Biggest



The Best

The Indispensable

The RAINBOW

It's called the *premier Color Computer magazine* for good reason. **The Rainbow** is the biggest, best, brightest and most comprehensive publication a happy CoCo ever had! Is there any wonder we get letters daily which praise **the Rainbow**, the magazine one reader calls "A Pot Of Gold" for his Color Computer?

The Rainbow features more programs, more information and more in-depth treatment of the TRS-80 Color, TDP System-100, MC-10 and Dragon-32 and 64 computers than anyone else.

Each monthly issue has as many as 340 pages and contains as many as two dozen programs some 15 regular columns and 30 or more product reviews. And advertisments: **the Rainbow** is known as *the* medium for advertisers — which means every month it has a wealth of information unavailable anywhere else about new products! More than 200 companies advertise in its pages every month.

But what makes **the Rainbow** is its people. People like Bob Albrecht, the master teacher of computer programming. People like Don Inman, one of the world's best computer graphics authors. Experts like Dick White, one of the most knowledgeable writers about BASIC. Or, Dan Downard, **Rainbow** technical editor, who answers our readers' toughest questions. Educators like award-winning **Rainbow** columnist Steve Blyn. Advanced programmers like Dale Puckett, who guides you through Radio Shack's OS-9 operating system. Electronics specialists like Tony DiStefano, who explains the "insides" of the CoCo. These people, and many others, visit you monthly through columns available only in **the Rainbow.**

Innovative ideas, like our Scratch and Sniff Adventure or our Anniversary special "soundsheets" with recorded programs, are ready to feed right into your computer! Complete Adventure games and Simulations. *The Rainbow's* unique *Scoreboard* of arcade games. And games — lots of them — super graphics and utilities, the world's first four-color computer magazine centerfold! And much, much more.

Join the tens of thousands who have found **the Rainbow** to be the absolute necessity for their CoCo. With all this going for it, is it surprising that more than 95 percent of **the Rainbow** subscribers renew their subscriptions?

We're willing to bet that, a year from now, you'll be doing the same. For more information call (502) 228-4492.

Get Your Very Own Pot O' Gold!

Here's your chance to have a Pot O' Gold full of programs, articles and information about CoCo every month of the year! A subscription to **the Rainbow** is only $28* and you won't miss a single chock-full issue.

As the premier magazine for the TRS-80 Color, TDP-100 and Dragon-32 and -64 computers, **the Rainbow** has more of everything — and greater variety, too. Do yourself and your CoCo a favor and subscribe to **the Rainbow** today!

We accept VISA, MasterCard and American Express. Non-U.S. rates higher. U.S. currency only, please.

YES! Sign me up for a year (12 issues) of **the Rainbow.**

☐ *NEW* ☐ *RENEW (Attach Label)*

Name ______

Address ______

City ______ *State* ______ *ZIP* ______

☐ Payment Enclosed (Payment must accompany order)

Charge ☐ VISA ☐ MasterCard ☐ American Express

Account Number ______

Signature ______ Card Expiration Date ______

*Subscriptions to **the Rainbow** are $28 a year in the United States. Canadian and Mexican rate is $35 U.S. funds. Surface rate elsewhere is $65 U.S. funds. Air mail is $100 dollars U.S. funds. All Subscriptions begin with the current issue. Please allow 5-6 weeks for the first copy.

MasterCard VISA AMERICAN EXPRESS Cards Welcome

Rainbow On Tape Tops Typing

Tired of spending all your valuable computer time typing in those long, but wonderful, **Rainbow** *programs each month? Now there is* **Rainbow On Tape** *to help ease the pain.*

Each month all the lengthy programs (over 20 lines) in **the Rainbow** can come to you ready-to-run, thanks to **Rainbow On Tape**. At $70* per year — or $8 a tape ★★ — it is the biggest bargain going.

Back issues are available beginning with April, 1982. (except May 1983). Each month's tape will arrive at approximately the same time as that month's issue of **the Rainbow**.

YES! Sign me up for the biggest bargain going . . . **Rainbow On Tape!**

☐ *NEW* ☐ *RENEW (Attach Label)*

☐ *A Full Year* ☐ *A Month (Specify Month & Year ______)*

Name ______

Address ______

City ______ *State* ______ *Zip* ______

☐ Payment Enclosed (Payment must accompany order)

Charge ☐ VISA ☐ MasterCard ☐ American Express

Account Number ______

Signature ______ Card Expiration Date ______

*Subscriptions to **Rainbow On Tape** are $70 in the United States, $80 U.S. funds in Canada and Mexico and $95 U.S. funds in all other countries.

**Back issues of the tapes are $8 in the United States, $10 U.S. funds for Canada, Mexico and all other countries.

MasterCard VISA AMERICAN EXPRESS Cards Welcome

What goes well with *the Rainbow?*

The RAINBOW
THE COLOR COMPUTER MONTHLY MAGAZINE
FOCUS ON EDUCATION
CoCo Breakthrough!
Plus
The RAINBOW
on tape

Rainbow On Tape!

We call it the other side of THE RAINBOW and we may have to raise the price just to call your attention to it. With more than two dozen programs every month, ***Rainbow On Tape*** is a luxury service at a bargain basement price.

What is it? ***Rainbow On Tape*** is a monthly, cassette tape adjunct to THE RAINBOW and it's brimming with all the programs (those over 20 lines long) that fill the pages of the magazine. All you do is pop the cassette in your tape recorder and they're ready to run. No more lost weekends —or weeknights — typing, typing, typing. With ***Rainbow On Tape***, you can read the article in the magazine then, in seconds, you load it up and run it.

Yes, ***Rainbow On Tape*** is brimming with the programs that fill THE RAINBOW's pages each month. And, yes, you could type them in yourself, as many people do. But all of them? Every month? There simply isn't enough time.

Isn't it time your CoCo became a fulltime computer instead of a typewriter. Think how your software library will grow. With your first year's subscription, you'll get almost 300 new programs: games, utilities, business programs, home applications — the full spectrum of THE RAINBOW's offerings without the specter of keying in page after page and then debugging.

Rainbow On Tape — the "meat" of THE RAINBOW at a price that's "small potatoes." Food for thought. To get your first heaping helping, just fill out and return the attached reply card. No postage necessary.

Discover the other side of THE RAINBOW. It's not only a time-saver, it's the key to a whole new outlook!

BUSINESS REPLY CARD
First Class PERMIT No. 1 Prospect, KY
POSTAGE WILL BE PAID BY ADDRESSEE

RAINBOW
P.O. Box 385
Prospect, KY 40059

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

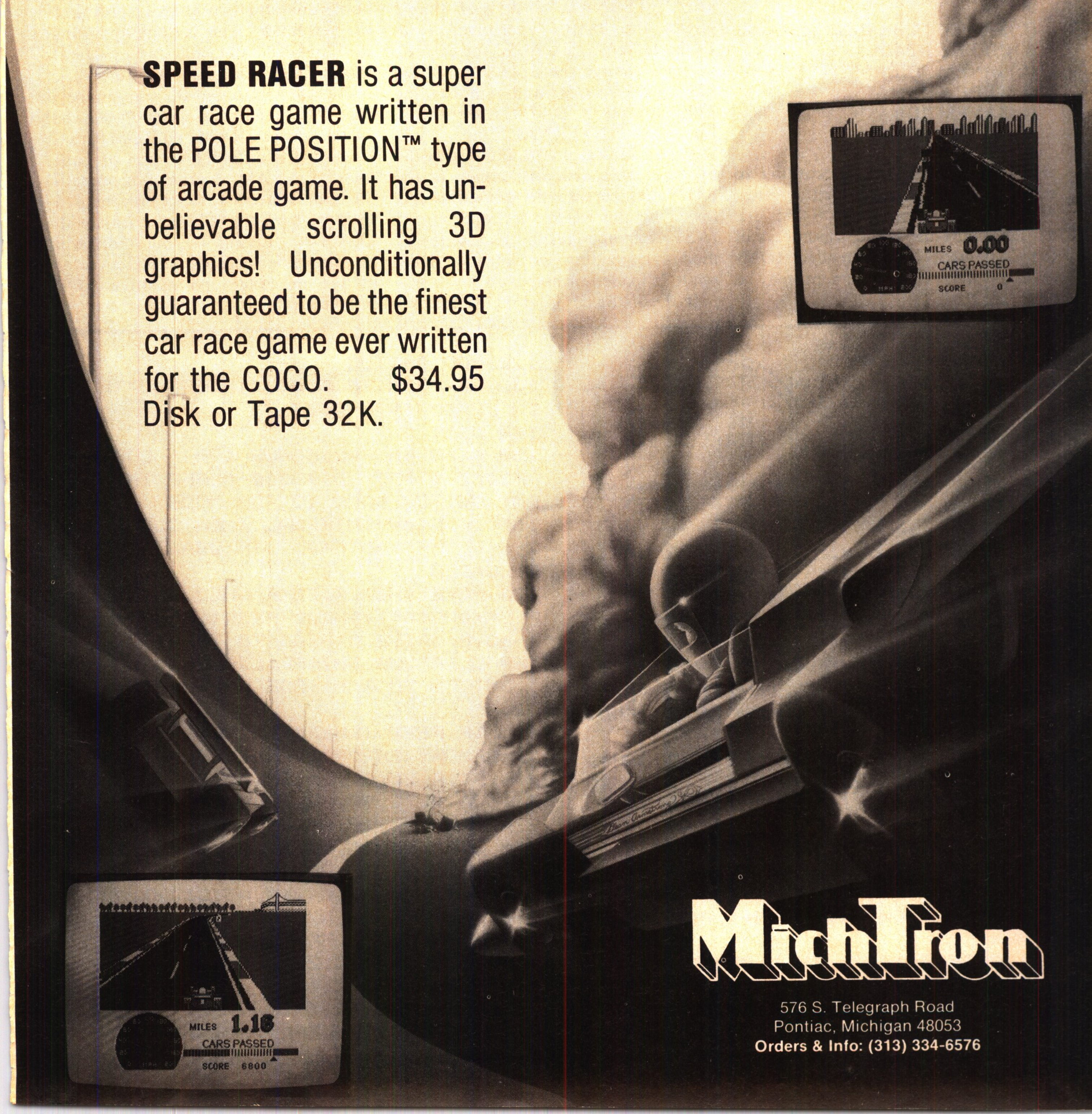
BUSINESS REPLY CARD
First Class PERMIT No. 1 Prospect, KY
POSTAGE WILL BE PAID BY ADDRESSEE

RAINBOW
P.O. Box 385
Prospect, KY 40059

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

SPEED RACER

SPEED RACER is a super car race game written in the POLE POSITION™ type of arcade game. It has unbelievable scrolling 3D graphics! Unconditionally guaranteed to be the finest car race game ever written for the COCO. $34.95 Disk or Tape 32K.


MILES 0.00
CARS PASSED
SCORE 0
MPH
MILES 1.16
CARS PASSED
SCORE 6800

MichTron

576 S. Telegraph Road
Pontiac, Michigan 48053
Orders & Info: (313) 334-6576

track zero, or even better, attempt to read an address field and use its track number.

The program listed below can be used to load any available combination of the three BASICs into RAM, either to substitute Disk BASIC 1.0 for a newer version ROM to run an incompatible program, or to upgrade to the revised versions. It requires 64K of RAM, and copies of whichever BASICs are to be replaced. To make these, you need to temporarily acquire a CoCo with the ROM versions you need, and make the necessary files,

```
(C)SAVEM "CBASIC12",&HA000,
&HBFFF,&HB44A
(C)SAVEM "XBASIC11",&H8000,
&H9FFF,&HB44A
(C)SAVEM "DBASIC11",&HC000,
&HDFFF,&HB44A
```

changing the filenames according to which version you're getting; i.e., "DBASIC10" for Disk 1.0 ROM, etc. To determine the revision numbers of the Color BASIC and Extended ROMs in each system, these statements may be used:

```
PRINT PEEK(41301)-48 ' Revision
of Color BASIC
PRINT PEEK(33023)-48 ' Revision
of Extended BASIC, if applicable.
```

Of course, if you don't feel like pirating the BASICs you need, you can always ask Radio Shack for help in getting your ROMs replaced. To use the *INSTALL* program, place either the word "INTERNAL" or a filename to be loaded for one of the three BASICs in each of the *DATA* statements in Lines 280-300, in the order of Color BASIC, Extended BASIC, Disk BASIC. If all three are "INTERNAL," *INSTALL* simply copies the BASICs unchanged from ROM to RAM. To make the cassette version, change the *LOADM* in Line 130 to *CLOADM*, and remove Line 170; also make *DATA* statement in Line 300 "INTERNAL" unless you want to add Disk BASIC. Either save the program on a disk with copies of the ROM files, or on tape, preferably followed by the ROM files, and run it. *INSTALL* operates in two different modes depending on whether Disk BASIC is loaded or not.

If Disk Basic is not loaded, no adjustments are necessary to BASIC's internal variables; in this case the user may insert a line like: *70 RUN "PROGRAM"* to *RUN* an application program after loading the set of BASICs. Afterwards the user may *POKE &HFFDE,0* or press Reset to switch back to ROM BASIC, and then *POKE &HFFDF,0* to bring back the RAM version.

If Disk BASIC is loaded, *INSTALL* assumes it is of a different revision than the one in ROM. Because different revisions of Disk BASIC have their routines moved around, it is necessary to set the hooks and other variables according to the new BASIC. This is done by calling the Extended BASIC cold start routine at $8002, and results in an automatic *NEW* and printing of the sign-on message. The practice of using *POKEs* to switch between RAM and ROM causes a crash if a different version of Disk BASIC is in RAM because of incompatible hook addresses. Reset may be used to bring back the ROMs, at least with Disk BASIC 1.0 and 1.1, but BASIC will be cold started because the Reset vector at $71 no longer points to a NOP instruction.

130 201
END 211

The listing:

```
10 REM INSTALL PROGRAM FOR BASIC
S
20 REM ANDY KLUCK 8-16-83
30 X=PEEK(&H8000):POKE &H8000,25
5-X
40 IF PEEK(&H8000)<>X THEN POKE
&H8000,X:PRINT"ERROR- PROGRAM MU
ST BE STARTED  IN ROM MODE":END
50 GOTO 310
60 POKE &H9D,&HB4:POKE &H9E,&H4A
:PCLEAR 4:POKE&HFFDF,0 ' SET EXE
C POINTER TO FC ERROR; SWITCH TO
 RAM
70 END
80 CLEAR 200,&H1EFF
90 FOR I=&H1F00 TO &H1F3D:READ I
$:X=VAL("&H"+I$):S=S+X:POKE I,X:
NEXT
100 IF S<>6475 THEN PRINT"DATA E
RROR":STOP
110 EXEC &H1F00:GOSUB 190 ' COPY
 ROMS TO $2000-$7FFF
120 FOR I=1TO3
130 READFI$:IF FI$<>"INTERNAL"TH
EN LOADMFI$,&HA000
140 NEXT
150 EXEC &H1F02:GOSUB 190 ' COPY
 $2000-$7FFF TO $8000-$DFFF IN R
AM; SWITCH BACK TO ROM MODE.
160 IF FI$="INTERNAL"THEN CLEAR
200,&H7FFF:GOTO60 ' IF DBASIC NO
T LOADED
170 POKE &HEA,0:POKE &HEB,0:EXEC
PEEK(&HC004)*&H100+PEEK(&HC005)
' MOVE DRIVE 0 HEAD TO TRACK 0
180 CLEAR200,&H7FFF:EXEC &H1F05
' SWITCH TO RAM MODE AND JMP $80
02
190 IF PEEK (&H1F04) THENPRINT"B
AD MEMORY ERROR":END ELSE RETURN
200 DATA 20,09,20,0F,00,B7,FF,DF
210 DATA 7E,80,02,8E,80,00,CE,20
220 DATA 00,20,0B,8E,20,00,CE,80
230 DATA 00,1A,50,B7,FF,DF,7F,1F
240 DATA 04,31,89,60,00,34,20,EC
250 DATA 81,ED,C4,10,A3,C1,27,05
260 DATA 86,01,B7,1F,04,AC,E4,26
270 DATA EE,B7,FF,DE,35,A0
280 DATA CBASIC12
290 DATA XBASIC11
300 DATA DBASIC11
310 PMODE0,1:PCLEAR1:GOTO80
```

This is the second of a three-part series on diskette file organization

The Diskette Directories Handler System Part 2

By Marvin E. Swan

Last month program *DIR1* and reports one through four were presented. This month, Part 2, with program *DIR2* and report 5 is being presented. You must run last month's program before running this month's program. Next month, Part 3, with final program *DIR3* and reports 6, 7, and also program *DIR0* which generates a quick and dirty documentation report will be presented.

Refer to last month's article for a complete overview of all seven comprehensive reports generated by the *Handler* system and an explanation of last month's program *DIR1*. To refresh your memory, here is the cross reference of all programs and reports and their *RUN* sequence:

PROG. NAME	OPTIONAL REPORT?	REPORT TITLE	SEQUENCED BY
DIR0	no	DOCUMENTATION	
DIR1	yes	#1 EXTR. & LOAD DIR.	your own diskette filing
"	yes	#2 DISKETTE NAMES	diskette name
"	yes	#3 DISKETTE USAGE	number of bytes used
"	yes	#4 DISK JACKET LABELS	your own diskette filing
DIR2	yes	#5 DISK LABELS (gum)	your own diskette filing
DIR3	no	#6 CONSOLIDATION	prog/size/diskette name
"	no	#7 SUMMARY (stats)	

Diskette Gum Labels Report 5

This month, report 5 is generated by program *DIR2*. The purpose of report 5 is to print diskette names onto gum labels for attachment to your diskettes. Two sizes are available: 3½ x $^{15}/_{16}$ inches and 4 x 1$^{15}/_{16}$ inches.

Program DIR2

The purpose of *DIR2* is to print diskette names onto diskette gum labels. A choice of two label sizes is available. *DIR2* prompts you to place the proper sized labels in your printer then gives you a printer line-up procedure. *DIR2* is automatically run by program *DIR1* if you previously selected report option 5 during *DIR1* processing, otherwise, *DIR2* is bypassed and program *DIR3* is automatically run. When *DIR2* is complete, it automatically runs *DIR3*. The following BASIC line numbers contain Epson brand printer codes that you may change to satisfy your printer requirements: 0510, 0960, 1020, 1030, 1040 and 1330.

A Continuing Saga . . .

Next month the final program *DIR3* will be presented, which generates Consolidated Directories report 6 (the most important and useful of all seven reports) and Disks Directory Summary report 7. Also, program *DIR0* which prints a quick and dirty explanation of the *Handler* system when you can't find your RAINBOW for reference (shame on you). So long until next month.

180	111
380	226
590	17
850	242
1050	172
1320	49
END	16

The listing:

```
10 CLS:PRINT
20 VERIFYON:P=1
30 XP=INT((256*PEEK(25)+PEEK(26)
-256*PEEK(188))/1536)
40 IF P=XP THEN 70 ELSE IF P<XP
THEN 1620 ELSE PCLEAR P:GOTO70
50 '
60 '
70 '[DIR2]
80 'DISKETTE DIRECTORIES HANDLER
90 'PROGRAM 2 OF 3
100 'COPYRIGHT 1984 BY MARV SWAN
110 '
120 'HOUSEKEEPING
130 '
140 D1$=CHR$(77)+CHR$(65)+CHR$(8
2)+CHR$(86)+CHR$(39)+CHR$(83)+CH
R$(32)+CHR$(67)+CHR$(79)+CHR$(77
)+CHR$(80)+CHR$(85)+CHR$(84)+CHR
$(69)+CHR$(82)+CHR$(32)+CHR$(82)
+CHR$(79)+CHR$(79)+CHR$(77):D2=7
0:D4=50
150 D2$=CHR$(80)+CHR$(82)+CHR$(6
9)+CHR$(83)+CHR$(69)+CHR$(78)+CH
R$(84)+CHR$(83):D3=140
160 CLS:PRINT@D2,D1$;:PRINT@D3,D
2$;:X=X+1:IFX<D4 GOTO160
170 IFX=0THENNEWELSECLS:CLEAR100
0
180 GOSUB1440:PRINT@128," turn Y
OUR SOUND UP":FORX=1TO70:SOUND10
,1:NEXTX
190 '
200 GOSUB1440:SOUND10,3:PRINT@12
8," insert WORK FILE INTO DRIVE
0    type WORK FILE NAME
     1-8 CHARACTERS/NO EXTENSION"
210 PRINT"    ........":PRINT@225
,"";:INPUTFI$
220 IFLEN(FI$)<1 OR LEN(FI$)>8 G
OTO200
230 I=INSTR(FI$,"/"):IFI<>0 GOTO
200
240 I=INSTR(FI$,"."):IFI<>0 GOTO
200
250 FORX=3TO11
260 DSKI$0,17,X,A$,B$
270 F=INSTR(B$,FI$)
280 IFF>0THENFT=FT+1
290 F=INSTR(A$,FI$)
300 IFF>0THENFT=FT+1
310 NEXT
320 IFFT=0THENFT=0:SOUND10,3:GOS
UB1440:PRINT@128," '";FI$;"' NOT
 ON DRIVE 0":PRINT" press ENTER
TO retype FILE      NAME":GOSUB1
400:GOTO200
330 FI$=FI$+".DIR"
340 '
350 GOSUB1440
360 CNTR=0:AGAIN$=""
370 PRINT@101," select GUM LABEL
 SIZE ";:PRINT@133," load PRINTE
R W/LABELS ";
380 PRINT@197," (1)  3-1/2  BY
15/16 ";
390 PRINT@229," (2)  4  BY  1-15
/16   ";
400 PRINT@261," (E)  END OF JOB
     ";
410 GOSUB1400
420 IF I$="1" GOTO490
430 IF I$="2" GOTO860
440 IF I$="E" GOTO1300
450 GOTO410
460 '
470 'PRINT 3-1/2" X 15/16" GUM L
ABELS
480 '
```

```
490 GOSUB500:GOTO510
500 GOSUB1440:PRINT"PRINTING DIS
KETTE GUM LABELS,    SIZE 3-1/2 B
Y 15/16.....":RETURN
510 PRINT#-2,CHR$(27);"W";CHR$(1
);  'SET TO LARGE LETTERS
520 OPEN"I",#1,FI$
530 INPUT#1,REC$  'DATE
540 INPUT#1,REC$
550 '
560 IFREC$="T0TALS"GOTO1270
570 '
580 DISK$=MID$(REC$,22,20)
590 IF RIGHT$(DISK$,3)="   " THE
N PRINT#-2,LEFT$(DISK$,17):LK=LK
+1:GOTO690
600 FOR Y=17 TO 1 STEP-1
610 IF MID$(DISK$,Y,1)=" " THEN
Z=Y:Y=0
620 NEXT Y
630 IF Z<4 THEN Z=0
640 IF Z=1 THEN Z=0:DISK$=RIGHT$
(DISK$,19)+" "
650 IF Z=0 THEN PRINT#-2,LEFT$(D
ISK$,16);"-":PRINT#-2,TAB(13)RIG
HT$(DISK$,4):GOTO680
660 PRINT#-2,LEFT$(DISK$,Z-1)
670 PRINT#-2," ";RIGHT$(DISK$,20
-Z)
680 LK=LK+2
690 IF LK<>6 THEN PRINT#-2:LK=LK
+1:GOTO690
700 '
710 HREC$=REC$
720 LK=0
730 INPUT#1,REC$
740 IFREC$="T0TALS"GOTO1270
750 IFRIGHT$(REC$,21)=RIGHT$(HRE
C$,21)GOTO730  'SAME DISKETTE
760 CNTR=CNTR+1
770 IF CNTR<>3 GOTO580
780 GOSUB1490
790 IF AGAIN$="N" GOSUB500:GOTO5
80
800 CLOSE#1
810 CNTR=0
820 GOTO490
830 '
840 'PRINT 4" X 1-15/16" GUM LAB
ELS
850 '
860 GOSUB870:GOTO880
870 GOSUB1440:PRINT"PRINTING DIS
KETTE GUM LABELS,    SIZE 4 BY 1-
15/16.....":RETURN
880 OPEN"I",#1,FI$
890 INPUT#1,REC$  'DATE
900 INPUT#1,REC$
910 '
920 IF REC$="T0TALS"GOTO1270
930 '
940 DISK$=MID$(REC$,22,20)
950 PRINT#-2
960 IF RIGHT$(DISK$,1)=" " THEN
PRINT#-2,CHR$(14);LEFT$(DISK$,19
):PRINT#-2:PRINT#-2:GOTO1060
970 FOR Y=19 TO 1 STEP-1
980 IF MID$(DISK$,Y,1)=" " THEN
Z=Y:Y=0
990 NEXT Y
1000 IF Z<4 THEN Z=0
1010 IF Z=1 THEN Z=0:DISK$=RIGHT
$(DISK$,19)+" "
1020 IF Z=0 THEN PRINT#-2,CHR$(1
4);LEFT$(DISK$,16);"-":PRINT#-2,
CHR$(14);TAB(13)RIGHT$(DISK$,4):
PRINT#-2:GOTO1060
1030 PRINT#-2,CHR$(14);LEFT$(DIS
K$,Z-1)
1040 PRINT#-2,CHR$(14);" ";RIGHT
$(DISK$,20-Z)
1050 PRINT#-2
1060 PRINT#-2:PRINT#-2:PRINT#-2
1070 PRINT#-2,STRING$(38,".")
1080 PRINT#-2,"     \"
1090 PRINT#-2,"      \"
1100 PRINT#-2,"       cut along t
his dotted line"
1110 PRINT#-2,"       and place o
nto diskette"
1120 '
1130 HREC$=REC$
1140 INPUT#1,REC$
1150 IFREC$="T0TALS"GOTO1270
1160 IFRIGHT$(REC$,21)=RIGHT$(HR
EC$,21)GOTO1140  'SAME DISKETTE
1170 CNTR=CNTR+1
1180 IF CNTR<>3 GOTO940
1190 GOSUB1490
1200 IF AGAIN$="N" GOSUB870:GOTO
940
```

LOOK LOOK

AFFORDABLE # SOFTWARE
FOR YOUR TRS-80 COLOR COMPUTER

1. Accounts Payable	59^{95}	5. Budget	49^{95}
2. Accounts Receivable	59^{95}	6. Mail Labels	49^{95}
3. General Ledger	59^{95}	7. Master Bus 1-6	99^{50}
4. Payroll	79^{95}	8. Personal Tax	79^{95}

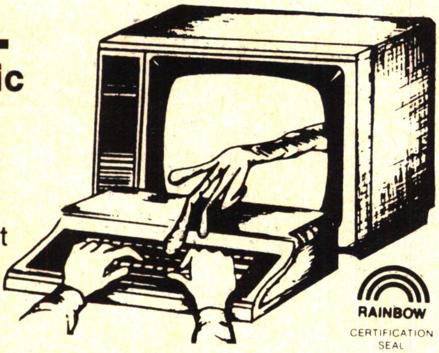
PROGRAMS REQUIRE EXTENDED BASIC WITH DISK DRIVE

WE ACCEPT MONEY ORDERS and PERSONAL CHECKS

BLUEGRASS SOFTWARE
RT. 3, B-2, FRANKLIN, KY 42134

“The Best Typing Teacher For The Color Computer”

E.T.T.
Electronic Typing Teacher
by
CHERRYSoft



RAINBOW CERTIFICATION SEAL

Learning to type the right way can save you hours of tedious work when entering programs into your CoCo, and this is just what ETT was designed to do. Devote a little time every day practicing with ETT and before you know it you will be typing with confidence. Entering those programs will no longer be the chore it used to be.

ETT's video keyboard lets you practice with all the keys labeled, all the keys blank or only the "home" keys labeled. The visual cues guide you while you learn to type without watching your fingers. ETT shows your accuracy, response time, and words per minute. You will quickly see that you are improving with practice.

With the sentences provided by ETT learning to type can be fun. Over 1000 variations chosen because they include every letter in the alphabet. You can also create your own practice sets. This outstanding program was written by a certified teacher and professional programmer and comes with a ten page student manual-study guide. Requires 16K Extended Basic.

Cassette $21.95 plus $2.50 shipping

"It's fairly obvious to someone with a couple of decades of typing experience that a professional instructor was instrumental in setting up this sophisticated program. It is a serious program for the person who wants to learn to type. It is not a game by any means, but it does make learning fun.

. . .an incredible value."

RAINBOW REVIEW
JULY 1984

"We bought the program ET, from you and it is an excellent tape for drilling and learning."

ST. ISIDORE SCHOOL
NEWTON, WISCONSIN

"Just received Electronic Typing Teacher it is the best typing tutor for Color Computer — Thanks."

TOMLINSON JR. HIGH SCHOOL
FARIFIELD, CONNECTICUT

ETT is now being used by schools and colleges throughout the U.S.
See E.T.T. at your favorite dealer or order direct.

DEALER INQUIRIES INVITED

SOFTWARE AUTHORS. . .Let us market your program.

MasterCard VISA CoCo Warehouse
Where Shopping By Mail is "USER FRIENDLY"
500 N. DOBSON · WESTLAND, MI 48185
Phone (313) 722-7957

```
1210 CLOSE#1
1220 CNTR=0
1230 GOTO860
1240 '
1250 'END OF JOG
1260 '
1270 CLOSE#1  'END OF REPORT #5
1280 '
1290 'GO PRINT REPORT #6 & #7
1300 GOSUB1440
1310 PRINT"take LABELS OUT OF TH
E PRINTER  AND load up 8-1/2 X 1
1 PAPER,   press ENTER TO PROCES
S THE NEXT PROGRAM DIR3, FROM DR
IVE 0, FOR PRINTING REPORT #6 AN
D #7 OR    press 'E' TO EXIT TO
BASIC"
1320 GOSUB1400
1330 PRINT#-2,CHR$(27);"W";CHR$(
0);  'set to normal letters
1340 IFI$="E"THEN END
1350 RUN"DIR3.BAS"
1360 END
1370 '
1380 'G o s u b s
1390 '
1400 I$=INKEY$
1410 I$=INKEY$:IF I$="" GOTO1410
1420 RETURN
1430 '
1440 CLS2:PRINT@4,"PRINT DISKETT
E GUM LABELS";
1450 PRINT@41,"PROGRAM 2 OF 3 ";
1460 PRINT@96,"";
1470 RETURN
1480 '
1490 GOSUB1440
1500 PRINT@99," select PRINTER F
UNCTION    ";
1510 PRINT@163," (1)  PRINT ALIG
NMENT AGAIN";
1520 PRINT@195," (2)  PRINT LABE
LS          ";
1530 PRINT@227," (3)  RETURN TO
MAIN MENU  ";
1540 PRINT@259," (E)  END OF JOB
          ";
1550 GOSUB1400
1560 IF I$="1" THEN AGAIN$="Y":R
ETURN
1570 IF I$="2" THEN AGAIN$="N":R
ETURN
1580 IF I$="3" GOTO350
1590 IF I$="E" THEN CLOSE#1:GOTO
1300
1600 GOTO1550
1610 '
1620 PMODE0:PCLEARP:GOTO70
1630 'END
```

BASIC NECESSITIES!!

Software and Hardware Products for BASIC Programmers

EDITTRON™

Full-Screen Text Editor For BASIC Programs

EDITTRON is a position-independent, machine-language program that enables you to perform full-screen text editing of your BASIC programs. EDITTRON has ten (10) Cursor-Control functions that allow you to move freely within your BASIC program text and ten (10) time-saving Screen-Editing functions. This BASIC programming aid also features Auto-Repeating keys, Key-Tone on command, user-friendly Prompts and Error Messages, All ROM Compatibility, no ASCII Conversion, 24 pages of comprehensive Documentation, and a Quick Reference Chart.

EDITTRON requires a minimum system of 16K RAM and Extended Color BASIC.

CASSETTE .... $ 30   DISKETTE .... $ 32

LISTER

LISTER is a powerful programming aid that allows you to see and read your BASIC program in a New and Enhanced format we call a Logical-Listing. LISTER provides for Line-Number Margin, Statement-Splitting, Indented FOR-NEXT Loops and IF-THEN-ELSE statements. Uses the same LIST and LLIST commands as BASIC.

CROSS-REF

The CROSS-REF program generates listings of line-numbers and variables that are referenced within your BASIC program. Each entry will be followed by all of the line-numbers that reference that entry. Reference all or only one at a time. Alphabetic listing, Auto-Tab and Line-Number Wrap features enhance the readability of the CROSS-REF output.

VAR-DUMP

The VAR-DUMP program generates listings of Run-time variables and their values. The variables will appear on the list in the same order that they occur in the running BASIC program. VAR-DUMP lets you list unique or array variables. You can use VAR-DUMP to debug programs, dump arrays and to determine BASIC's variable-stack order.

All 3 programs are Machine-Language (PIC), and require 16K Extended Color BASIC. They all feature BASIC-like Command Syntax, 3 Scroll Speeds, Pause/Stop Output, Optional Header/Pagination to the Printer and Definable CPL, LPP, ALF, & BAUD.

One Program, $ 15 on Cassette /$ 17 on Disk. All Three for $ 30 and $ 34.

HARDWARE PRODUCTS

ROMs

BASIC ROM 1.1	$\$45^{00}$
BASIC ROM 1.2	$\$30^{00}$
E.C.B. ROM 1.1	$\$55^{00}$
D.E.C.B. ROM 1.1 ...	$\$30^{00}$

RAMs

4164—64K RAM	$\$6^{50}$
Set of Eight	$\$50^{00}$
4116—16K RAM	$\$1^{10}$
Set of Eight	$\$8^{00}$

I.C.s

6809E-1 MHz MPU ...	$\$25^{00}$
68B09E-2 MHz MPU .	$\$30^{00}$
6821—1 MHz PIA	$\$8^{00}$
68B21—2 MHz PIA ..	$\$10^{00}$
6883—SAM	$\$25^{00}$
6847—VDG	$\$20^{00}$
1 MHz Set of Four	$\$65^{00}$
2 MHz Set of Four	$\$70^{00}$
6822—H.D. PIA	$\$15^{00}$
1372—Video Driver	$\$5^{00}$
74LS02—NOR Gate ...	$\$1^{50}$
74LS138—Decoder	$\$2^{00}$

$\$7^{00}$ SOLDERLESS KITS

VT-8302 +12V Pilot Light Kit	$\$7^{00}$
VT-8303 Remote Reset Switch Kit ..	$\$7^{00}$
VT-8304 Rem. Power Switch Kit ...	$\$7^{00}$

Not Available for Color Computer 2.

SERIAL SWITCHERS

VT-8305 2-Port Serial Switcher ...	$\$25^{00}$
VT-8305PL 2-Port Serial Switcher with Mounted Pilot Light	$\$30^{00}$
VT-8306 3-Port Serial Switcher ...	$\$30^{00}$
VT-8306PL 3-Port Serial Switcher with Mounted Pilot Light	$\$35^{00}$

MISCELLANEOUS

VT-8401 Cooling Fan Kit	$\$25^{00}$
6' T.V. Cable with R.F.I. Filter ...	$\$15^{00}$
Clip-on Heatsink for 40-Pin I.C.s ..	$\$1^{50}$
RAM Button, 16K, 32K or 64K	$\$3^{50}$
IC Extractor for 16-24 Pin I.C.s	$\$3^{00}$
DIN, Cable, M or F, 4, 5 or 6-Pin ..	$\$1^{50}$
DIN, Chassis, Fem., 4, 5 or 6-Pin ..	$\$2^{00}$

3-D

TIC-TAC-TOE

Challenge your computer to a game of 3-D Tic-Tac-Toe. You can control your computer's intelligence by selecting one of 5 different skill levels. 3D-TTT has Hi-Res, 3-D Graphics, M/L Sound, and a 4x4x4 Matrix, with 64 Squares, and 76 Winning Combos. 3D-TTT is an M/L Enhanced BASIC Program for 1 or 2 Players, Keyboard or Joystick Operation, and Requires 32K, E.C.B.

CASS. $10 / DISK $12

$\$8^{00}$ M/L UTILITIES*

AUTOKEYS — Auto-Repeating keys to help you cut down on keystrokes. AUTOKEYS gives you 16 repeat speeds to suit your typing style.

AUTO-NUM — Automatically generates sequential line numbers to make BASIC program entry easier. Defineable start and increment.

COMPRESS — Removes unnecessary spaces and unwanted remarks from your BASIC programs. Displays output and bytes saved.

FUNCTION — Define ten keys on your keyboard as Functions of up to 100 characters each. Functions may include multiple statements and ENTER keys for auto-executing commands.

GARBAGE — Does your computer seem to 'Lock-Up' for seconds or minutes at a time. GARBAGE solves this problem by improving BASIC's string collection time by 98%+. (64K)

HI-BASIC — RUN your BASIC program from the upper 32K block. This opens up the lower 32K for large amounts of data, such as mailing lists, data bases, graphic arrays, etc. (64K)

KEYKLICK — Provides audio-feedback in the form of clicking keys. This feedback will save you time by helping to reduce your typing errors.

NEWERROR — Provides expanded BASIC error messages. Replaces normal 2-letter error messages with full, readable error statements.

NEWLLIST — Generates BASIC program listings to the printer with line number margin. Optional Header and Pagination, user definable LPP, CPL, ALF and BAUD rates. (ECB)

PM4PRINT — Outputs PMODE4 graphic screens to DMP-100 compatible printers. POS, NEG, and TAB output features included. (ECB)

QUICKEYS — Simplifies BASIC program input by enabling 2-keystroke entry of most BASIC words. Key index output to screen or printer.

REACTION — Provides for automatic last-command entry recall. Two keys reprint last command onto screen. A real timesaver!

ROM-BOOT — Allows access to full 64K Map. You can POKE and PEEK data, LOAD M/L code into high RAM, and alter the ROMs. (64K)

SOFT-VID — Provides you with four different text screen formats. Green/Black or Orange/Red text in Normal or Reversed video. (64K)

*All VIDTRON M/L Utilities are written in position-independent code and require a minimum of 16K Color BASIC unless specified.

CASS.—One for $12, Two or More for $8 Each
DISK—One for $14, Two or More for $10 Each

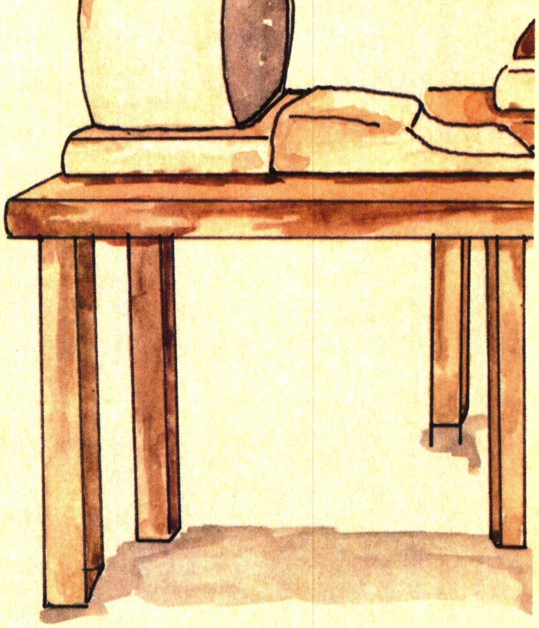
TERMS: Cashier's checks and money orders for immediate delivery ● Personal checks allow 2 weeks ● Orders $100 to $199⁹⁹, take 10% discount ● Orders $200 and over take 15% discount ● California residents add 6% Sales Tax ● Orders under $25 add $2 shipping ● U.S. C.O.D. orders add $4

★ FREE ★
CATALOG

VIDTRON™

4418 East Chapman Ave., Suite 284
Orange, California 92669
Call Anytime–(714) 639-4070

Christmas Card File And Labeler



By James D. Ball

Aside from carrying out the garbage, income taxes, and trying to get the kids to bed, one of the tasks I dread most is sending out the Christmas cards. When we purchased our first Color Computer, I thought the latter was the ideal application for the common good of the household. It was, and the original program has served us well for the past three years.

(James D. Ball holds degrees in business and chemical engineering. He is manager of new technology and market research for the Norton Company, Chemical Process Products Division located in Akron, Ohio. He is a self-taught programmer and married with two children.)

That original program had everything desired; all the necessary functions, ease of use, idiot-proof features, and a format that was very workable. It also had its limitations. The big limitation was that it was based entirely upon I/O to the disk for all operations. That's okay provided the system isn't in its seemingly cyclic directory crash mode. Too, because it was all I/O disk-based, it was relatively slow.

Due to the fear of directory crashes and inherent slowness, I decided to rewrite the program. I wanted to retain the original features but convert the program to all in-memory operation. This would be fast yet sufficient for a mailing list/record base which was not meant for extensive records.

The rewrite proved to be no small task but armed with the Colorkit (available through Prickly-Pear Software), the task was somewhat simpler. Like others, I find it difficult to suppress the urge to expand upon an original work. This was no exception. The labeler section to the rewrite is an example of incorporating several tricks learned over the years. Ultimately, added features had to be excluded due to memory limitations.

About The Program

The program is usable from the start with nothing special to learn, no preloading of screen utilities, no machine code to understand, no preliminary

CARDS TO SEND
BOOT WAX

PEEKs or *POKEs*, and no alternative operating system. The minimum requirements include a 32K Color Computer operating under the "standard" Disk BASIC and drive 0. A printer is obviously necessary for hard copy. The program functions include: sorting, listing, labeling, editing, deleting, updates, and tracking incoming and out-going cards by year.

Since the program is used seasonally, error trapping is extensive lest we forget procedures. Everything is menu-driven and the option to escape to the main menu is strategically present along with all request prompts. As presented, 100 records can be read into memory. This is more than enough for most uses. Should the cost of postage ever decline, or the number of acquaintances increase, up to 125 records can be accommodated. Make a second file (on another disk) or wait until Tandy decides to issue a new ROM which would move the resident code further up in memory.

To eliminate extensive disk I/O, the entire file is read into a single-dimensioned string array upon initialization. All maintenance, input and output is accomplished from memory. Only if the file option is selected will the disk be accessed a second time to document the changes.

Lists are available to the screen or printer. The lists available include cards sent or received in a selected year, or the entire file in increment pages for the screen option. For the labeler, output options include individual labels, a full run, or a run by target/non-target ZIP code. A tab spacing test is available and labels may be printed in single- or double-column format. With the exception of individual labels, output is keyed to the current year requested at the start of the run.

When the program is loaded, the cover screen and credits are displayed with a request to insert the data diskette. (I've grown fond of separate data files.) Initialization is immediate upon answering the request and takes you into the main menu. If no records are resident the only options accessible will be data entry (option 4), or exiting the program.

In the data entry mode, a request is made for the current year. Next are the name and address entries. A fore-title selection (Mr. and Mrs., etc.) is presented along with the optional "& Family." Next is the last card received (two-digit year) and a "Send card this year (Y/N)?" which relates to the current year input earlier. In all, nine string fields are recorded per a 75-character record. Each entry is error-trapped and space padded as necessary.

After all data has been entered into memory, a sort (option 5), may be performed if desired. Prior to hard copy operations a sort will be required if there are deleted records present, but the program will inform you of this. Any option can be invoked at any time. When finished you can exit the program (option 7), but if not, you can file (option 6) the memory contents for the next time. In fact, it's good procedure to invoke the file option before utilizing the labeler.

TABLE 1 PROGRAM OUTLINE

Function / Operation	Lines
Initialization	230 - 280
Main Menu	310 - 400
Update/ Edit-Delete/ Review	420 - 970
Menu	420 - 460
Send/ Receive	470 - 620
Name Search	630 - 700
Record Delete	690 - 720
Record Edit	800 - 970
Lists	990 - 1390
Menu	990 - 1390
Output Selections	1030 - 1120
Output Operations	1130 - 1390
Labels	1410 - 1890
Output Selections	1410 - 1580
Test Run	1590 - 1630
Output Operations	1640 - 1890
Printer Check/ Baud Rate	1910 - 1950
Data Entry	1970 - 2070
Sort	2090 - 2150
File	2170 - 2240
Menu Return/ Program End	2250 - 2280
Subroutines	2300 - 3150
Misc.	2300 - 2410
Last-First Name	2420 - 2480
Street Address	2490 - 2520
City	2530 - 2540
State	2550 - 2560
ZIP Code	2570 - 2590
Title Deciphers	2600 - 2640
EOF Verify	2650 - 2660
Zero Record Check	2670 - 2680
Deleted Record Check	2690 - 2700
Title Strings	2710 - 2730
Receive/ Send Year	2740 - 2810
Create-Pad Name	2820 - 2840
Pad Street,City,State	2850 - 2880
Move to Array	2890 - 2890
Retrieve-Strip Name	2900 - 2910
Retrieve-Strip Others	2920 - 2980
Title Translation	2990 - 3060
Color Border	3070 - 3090
Double Label Print	3100 - 3110
Label Tab Set	3120 - 3150
Cover Page	3170 - 3260

The next time the file is accessed, you'll probably wish to update the cards received through option 1. This same option can be used to edit the entire record or to delete it. These functions are performed sequentially or selectively through checking names. You only need to input the first few letters of the target name to be presented with records from which to choose. If you're unsure of the spelling, you can check the full listing (option 2) in the screen mode.

Program Techniques

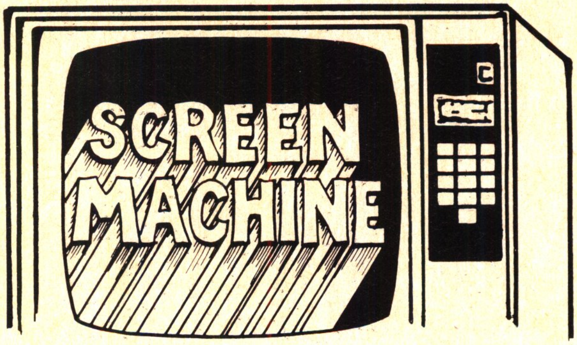
For those interested, you'll notice I've chosen to utilize direct access files because it is simpler and allows greater versatility. Sequential files could have been used as well with some alterations to the initialization and filing sequence. Such alterations could also apply to tape files but Extended Color BASIC is mandatory. Any such file alterations I leave in your hands.

"The program functions include: sorting, listing, labeling, editing, deleting, updates, and tracking incoming and out-going cards by year.

Each field is concatenated in order and placed into a string array *A$()*. Field changes utilize the *MID$* function extensively. This is efficient and saves on garbage collection (not the urban type). The variables I and R designate the current array (record) number, depending upon the operation. Periodic checking is done to verify the last record on file, Z. The maximum allowable records, XF, is initialized to 100 and is independent of the file to be used meaning the original file can be extended if XF is achieved in earlier sessions. Therein lies a major difference between direct and sequential files in this application.

Sugar Software

Sugar Software



The Ultimate!

RAINBOW SCREEN MACHINE

SUPER SCREEN MACHINE

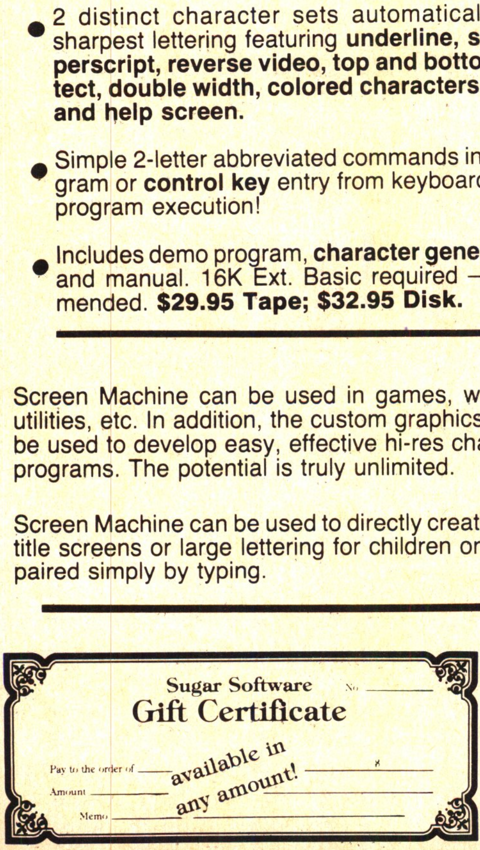
- **The Rolls Royce of graphics/text screen enhancers — more screen features than all others combined!**
- Add these features to your computer/program: ML extension of Basic loads on top of 16, 32, or 64K machines to enable easy mixture of **hi-res graphics and text** in your programs. Dense text or large lettering for children, visually impaired or VCR title screens with no programming!
- User definable 224 character set featuring lower case descenders, Greek, cars, tank, planes, etc., completely interfaced with **all keys, commands, and PMODES.** 12 sizes (most colored) from 16 x 8 to **64 x 24. PRINT @, TAB and comma fields are fully supported.**
- 2 distinct character sets automatically switch for sharpest lettering featuring **underline, subscript, superscript, reverse video, top and bottom scroll protect, double width, colored characters in PMODE 4, and help screen.**
- Simple 2-letter abbreviated commands inside your program or **control key** entry from keyboard, even during program execution!
- Includes demo program, **character generator** program and manual. 16K Ext. Basic required — 32K recommended. **$29.95 Tape; $32.95 Disk.**

Screen Machine can be used in games, word processors, utilities, etc. In addition, the custom graphics characters can be used to develop easy, effective hi-res character-graphics programs. The potential is truly unlimited.

Screen Machine can be used to directly create video recorder title screens or large lettering for children or the visually impaired simply by typing.

- **Revolutionary — heralded as the most useful, powerful and versatile state-of-the-art utility ever developed for the Color Computer!**
- All of the features of Screen Machine and more:
- Variable **SMOOTH Scroll** for professional displays, listings, business use.
- Variable volume **KEY Click** (tactile feedback).
- **EDTASM+ command** for instant compatibility with cartridge EDTASM
- **Superpatch+ command** for instant compatibility with the Superpatch+ Editor-assembler
- True **Break key** disable and recognition.
- 10 User Definable commands used to activate your special drivers or subroutine.
- Dynamic **Screen Dump command** for use with Custom Software Engineering's Graphic Screen Print program for simple printer "Snapshots" of your screen even during program execution!
- **The new standard** — Upgradeable at any time from previous Rainbow-Writer or Screen Machine purchase. Return old program, manual, plus cost difference and $7.00 shipping and handling.
- Super Screen Machine **$44.95 Tape; $47.95 Disk.**

Screen Machine is fully interfaced with all keys and commands. Although some Basic programming knowledge is recommended just a few minutes spent studying and referencing your computer's Basic manuals will turn you on to the power of computing with Screen Machine.



Sugar Software No. ________

Gift Certificate

Pay to the order of ________

Amount ________

Memo ________

available in any amount!

A complete catalog of other sweet Sugar Software products is available.

SUGAR SOFTWARE
2153 Leah Lane
Reynoldsburg, Ohio 43068
(614) 861-0565

No refunds or exchanges.

MasterCard VISA

Add $1.00 per tape for postage and handling. Ohioans add 5.5% sales tax. COD orders are welcome. CIS orders EMAIL to 70405, 1374. Dealer inquiries invited.

TABLE 2 POSSIBLE ALTERATIONS

Element	Line Numbers	Function
POKE 65495,0	310,3170	Speed Poke - Eliminate if necessary
POKE 65494,0	1930,2210 2280,3260	Return Clock - Do not remove if Speed Poke is retained
POKE 111,0	1300,1820	Forced Return to Screen - Optional removal
POKE 150,1	1950	Baud Rate Poke - Edit to suit
"9600"	1910	Edit per Baud rate poke
CHR$(27)"@"	1150	Printer Initialization Code - Optional removal, useful if Opt.2 run follows Opt.3
CHR$(27)"O"	1670	Abort Perf. Skip - retain this or equivalent if system provides auto form feed
CHR$(14) / CHR$(20)	3000,3020, 3040	Print Elongation - Optional removal or replacement

TABLE 3 MAJOR VARIABLES

Var.	#Chrs.	Description
NAM$	23	Name = LN$(Stripped)+", "+FI$; Padded; Field#1
SN$	21	Street Address; Padded; Field#2
CTY$	15	City; Padded; Field#3
ST$	5	State; Padded; Field#4
ZIP$	5	ZIP Code; Field#5
T1$	1	Fore-title Decipher; Field#6
T2$	1	Post-title Decipher; Field#7
RC$	2	Latest Year Card Received; Field#8
SC$	2	Latest Year Card Sent; Field#9
LN$	12	Last Name; Padded
FI$	10	First Name (MI); Padded
A$()	75	Record Array
INFO$	75	Record String
I,R	-	Array (Record) Counter
Z	-	End of Existing Records
XF	-	Maximum Allowable Records
YR$	-	Current Year
MM$	-	MM; Main Menu Selection
LST$	-	LST; Listings Selection
RN$	-	RM; Labeler Run Selection
RU$	-	RU; Record Update Selection
T3$	-	Fore-title Translation
T4$	-	Post-title Translation

Total Variables = 63
Total References = 1027
Total Lines = 327
Total Statements = 994

Initialization accounts for all records plus the available space between Z and XF which is set to null strings. Sorting eliminates all deleted records and alphabetizes the array. This sort is done on the first field, *NAM$*. A deleted record is recognized by substituting the first string character with *CHR$(128)* which places the string at a higher value than lowercase "z" and can subsequently be eliminated. The major variables are listed in Table 3.

At the start of the program a *PCLEAR 1* is performed to allocate memory as long as this program — over 14800 bytes. The choice of *PCLEAR 1* as opposed to a *PCLEAR 0* is based on ease of use. No need to preset parameters. Enough string space is cleared in Line 230 for 100 records. To increase this to 125, set XF accordingly and *CLEAR10000*.

I'm certain we all have our idiosyncrasies in programming. One of mine is to exit the program from one and only one location, the main menu. This is beneficial though, as this program incorporates the high speed poke. These pokes, in strategic locations, can be eliminated should your machine not be able to endure the hardship. Too, Epson printer control codes are employed but these can be easily changed or eliminated to suit your needs. The program defaults the printer Baud rate to 9600. This can also be easily changed. I would suggest though that you experiment with the Baud rate poke in Line 1950. My experience is that it is not always as presented in the computer manual. Table 2 gives the locations of the potential alterations.

In Summary

This rewrite of the original program has met virtually all my criteria, however, it is long and possibly difficult to enter. As BASIC skips around a bit, I've tried to maintain some semblance of control in order to follow the logic. It could be worse. Because of memory constraints coupled with my wordy programming, you'll note the lack of space delimiters. I offer no other excuses but if you get this up and running, you'll thank me. If you study the program you will most likely get some ideas. It has served as a base for other programs I've concocted with yet different filing schemes.

As a side note, Tandy has a wonderful machine in the CoCo. I think enough of it that I'm on my second. The first was donated to our local school system. They're happy, Tandy is happy, and my accountant is happy.

330	199	2200	23
700	182	2450	86
1030	76	2610	117
1350	53	2750	78
1550	208	2930	180
1780	138	3180	63
2060	121	END	209

The listing:

```
10 '  * * * * * * * * * * * * * *
20 '  *                         *
30 '  *  CHRISTMAS CARD FILE    *
40 '  *       AND LABELER       *
50 '  *       (Ver.2.0)         *
60 '  *                         *
70 '  *       (C)  1984         *
80 '  *     James D. Ball       *
90 '  *    Uniontown, Ohio      *
100 ' *                         *
110 ' *  All Rights Reserved    *
120 ' * * * * * * * * * * * * * *
130 '
140 '
150 REM *** Minimum requirements
: 32K Color Computer * RSCDOS *
Drive0
160 '       Epson codes assumed
for hardcopy
170 '       XMASCRD/DAT = direct
 access file
180 '       Record size: 75 Char
acters; 9 Fields/Record
190 '       All in-memory operat
ion; Max. rec.(XF) set at 100
200 '
210 GOSUB3170' COVER PAGE
220 '
230 PCLEAR1:CLEAR8000:XF=100:DIM
A$(XF):CLS0:COL=8:GOSUB3070
240 PRINT@168,"XMAS CARD FILE";:
PRINT@200,"  AND LABELER ";:PRIN
T@325,"ONE MOMENT PLEASE     ";:P
RINT@357,"FOR INITIALIZATION..."
;
250 FORI=1TOXF:A$(I)="":NEXT
260 OPEN"D",#1,"XMASCRD/DAT",75:
FIELD#1,75ASINFO$:IFLOF(1)=0THEN
280
270 FORI=1TOLOF(1):GET#1,I:A$(I)
=INFO$:NEXT
280 Z=LOF(1):CLOSE#1
290 '
300 '----- MAIN MENU -----
310 K=0:C=0:N=0:CNT=0:I=0:SRT=0:
POKE65495,0
320 CLS(1):GOSUB2300:COL=2:GOSUB
3070:PRINT@67,"X M A S  C A R D
 F I L E";:PRINT@103,"M A I N
M E N U";
330 PRINT@164,"(1)  UPDATE/EDIT/
DELETE";:PRINT@196,"(2)  LISTING
S";
340 PRINT@228,"(3)  LABELER";:PR
INT@260,"(4)  DATA ENTRY";
350 PRINT@292,"(5)  SORT";:PRINT
@324,"(6)  FILE";
360 PRINT@356,"(7)  EXIT PROGRAM
";:PRINT@420,"CHOICE (1-7) ???";
370 MM$=INKEY$:IFMM$=""THEN370
380 MM=VAL(MM$):IFMM<1ORMM>7THEN
SOUND7,5:GOTO370
390 PRINTMM;:PRINT@447,CHR$(143+
(16*(COL-1)));
400 ONMMGOTO420,990,1410,1970,20
90,2170,2270
410 '---- UPDATE/EDIT/REVIEW ---
-
420 CLS(1):GOSUB2300:COL=3:GOSUB
3070:PRINT@68,"R E C O R D  U P
D A T E";:GOSUB2650:GOSUB2670:IF
Z=0THEN2250
430 PRINT@133,"(1)  SEND/RECIEVE
 LIST";:PRINT@165,"(2)  RECORD E
DIT";
440 PRINT@197,"(3)  RECORD DELET
E";:PRINT@261,"CHOICE (1-3) ? ";
:GOSUB2320
450 RU$=INKEY$:IFRU$=""THEN450EL
SEIFINSTR("M123",RU$)=0THENSOUND
7,5:GOTO450
460 PRINT@276,RU$;:IFRU$="M"THEN
310ELSERU=VAL(RU$):IFRU>1THEN630
470 PRINT@323,"sEND * rECEIVE *
bOTH ??? ";
480 SR$=INKEY$:IFSR$=""THEN480EL
SEIFINSTR("MSRB",SR$)=0THENSOUND
7,5:GOTO480
490 IFSR$="M"THEN310
500 FORR=1TOZ:GOSUB2900:GOSUB297
0:GOSUB2710
510 CLS:GOSUB2300:PRINT"RECORD "
;R;" --":PRINT:PRINTT3$;F1$;" ";
LN$:PRINT
520 PRINT"UPDATE THIS RECORD (Y/
N) ? ";:GOSUB2310:PRINTAN$:IFAN$
="N"THEN620
530 IFSR$="R"ORSR$="B"THEN540ELS
E570
540 PRINT:PRINT"LAST CARD REC'D
IN 19";RC$;" --"
550 LINEINPUT"YR REC'D UPDATE (2
-DIGITS)? ";RC$
560 IFLEN(RC$)<>2ORVAL(RC$)=0THE
NSOUND7,5:GOTO550ELSEMID$(A$(R),
72,2)=RC$
570 IFSR$="S"ORSR$="B"THEN580ELS
E620
580 PRINT:PRINT"LAST CARD SENT I
N 19";SC$;" --"
590 LINEINPUT"YR SEND UPDATE (2-
DIGITS) ? ";SC$
600 IFLEN(SC$)<>2ORVAL(SC$)=0THE
NSOUND7,5:GOTO590ELSEMID$(A$(R),
74,2)=SC$
610 IFRU=2THENIFAN=7THENRETURN
620 NEXTR:GOSUB2340:GOTO2250
630 CLS:GOSUB2300:PRINT@32,"ENTE
R NAME TO ";:IFRU=2THENPRINT"EDI
T";ELSEPRINT"DELETE";
640 PRINT" ***":PRINT:LINEINPUT"
LAST NAME >> ";LN$:X=LEN(LN$)
650 FORR=1TOZ:NX$=LEFT$(A$(R),X)
:IFLN$<>NX$THEN700
660 CLS:PRINT@32,"TARGET NAME =
";LN$:PRINT@96,"ON FILE : ";LEFT
$(A$(R),23):PRINT@128,"DESIRED R
ECORD (Y/N) ? ";:GOSUB2310:PRINT
AN$:IFAN$="N"THEN700ELSECNT=1
670 IFMM=3THEN1580
680 IFRU=2THEN800
690 IFRU=3THENA$(R)=CHR$(128)+"D
EL,"+STRING$(70,32):MID$(A$(R),7
0,2)="6N":GOTO720
700 NEXTR
710 IFRU=2THENIFCNT=1THENPRINT"E
DIT COMPLETE":GOTO770
720 IFRU=3THENIFCNT=1THENPRINT"R
ECORD DELETED":GOTO770
730 IFCNT=0THENSOUND7,5:PRINT@19
2,"NAME ENTERED NOT ON FILE...":
PRINT"CHECK SPELLING AND EITHER
--"
740 PRINT@288,"rE-ENTER OR sTOP
SEARCH ??? ";
750 AN$=INKEY$:IFAN$=""THEN750EL
SEIFINSTR("RS",AN$)=0THENSOUND7,
5:GOTO750
760 PRINTAN$:IFAN$="R"THENCLS:GO
TO630ELSEIFMM=3THENRT=1:GOTO1580
ELSE790
770 PRINT:PRINT"ANOTHER RECORD T
O ";:IFRU=2THENPRINT"EDIT ? ";EL
SEPRINT"DELETE ? ";
780 GOSUB2310:PRINTAN$:IFAN$="Y"
THENCNT=0:GOTO630
790 GOSUB2340:GOTO2250
800 GOSUB2900:GOSUB2920:GOSUB271
0:CLS:GOSUB2300:PRINT@11,"edit"C
HR$(128)"mode":PRINT
810 PRINT"1";CHR$(142);F1$;" ";L
```

```
N$
820 PRINT"2";CHR$(142);:IFT1$="6
"THENPRINT"(NO FORE-TITLE)"ELSEP
RINTT3$
830 PRINT"3";CHR$(142);:IFT2$="N
"THENPRINT"(NO POST TITLE)"ELSEP
RINTT4$
840 PRINT"4";CHR$(142);SN$:PRINT
"5";CHR$(142);CTY$;",";ST$;"  ";
ZIP$
850 PRINT"6";CHR$(142);"LAST CAR
D REC'D IN 19";RC$
860 PRINT"7";CHR$(142);"LAST CAR
D SENT IN 19";SC$
870 PRINT:PRINT"ENTER NUMBER (1-
7) TO CORRECT-  IF OKAY, ENTER Z
ERO : ";
880 AN$=INKEY$:IFAN$=""THEN880EL
SEIFASC(AN$)<48ORASC(AN$)>55THEN
SOUND7,5:GOTO880
890 AN=VAL(AN$):PRINTAN:CLS
900 IFAN=1THENGOSUB2420:GOSUB282
0:MID$(A$(R),1,23)=NAM$:GOTO800
910 IFAN=2THENGOSUB2600:MID$(A$(
R),70,1)=T1$:GOTO800
920 IFAN=3THENGOSUB2640:MID$(A$(
R),71,1)=T2$:GOTO800
930 IFAN=4THENGOSUB2490:GOSUB285
0:MID$(A$(R),24,21)=SN$:GOTO800
940 IFAN=5THENGOSUB2490:GOSUB285
0:MID$(A$(R),45,15)=CTY$:MID$(A$
(R),60,5)=ST$:MID$(A$(R),65,5)=Z
IP$:GOTO800
950 IFAN=6THENGOSUB2740:MID$(A$(
R),72,2)=RC$:GOTO800
960 IFAN=7THENGOSUB590:MID$(A$(R
),74,2)=SC$:GOTO800
970 IFAN=0THENCLS:GOTO710
980 '----- LISTS -----
990 CLS(1):GOSUB2300:COL=4:GOSUB
3070:PRINT@72,"L I S T I N G S";
:GOSUB2650:GOSUB2670:IFZ=0THEN22
50
1000 PRINT@134,"(1)  CARDS SENT"
;:PRINT@166,"(2)  CARDS RECEIVED
";
1010 PRINT@198,"(3)  COMPLETE FI
LE";:PRINT@262,"CHOICE (1-3) ? "
;:GOSUB2320
1020 LST$=INKEY$:IFLST$=""THEN10
20ELSEIFINSTR("M123",LST$)=0THEN
SOUND7,5:GOTO1020
1030 IFLST$="M"THEN310ELSELST=VA
L(LST$):PRINT@276,LST;:GOSUB2330
:IFLST=3THEN1060
1040 PRINT@322,;:LINEINPUT"WHICH
 YEAR (2-DIGITS) ? ";YR$:PRINT@3
51,CHR$(143+(16*(COL-1)));
1050 IFLEN(YR$)<>2ORVAL(YR$)=0TH
```

```
ENSOUND7,5:GOTO1040
1060 PRINT@386,"PRINTING DEVICE
:";:PRINT@418,"1=SCREEN 2=PRINTE
R CHOICE=";
1070 PD$=INKEY$:IFPD$=""THEN1070
1080 PD=VAL(PD$):IFPD<1ORPD>2THE
NSOUND7,5:GOTO1070
1090 PRINTPD;:PRINT@415,CHR$(143
+(16*(COL-1)));
1100 IFLST=1THENIFPD=1THENL=1ELS
EIFLST=1THENIFPD=2THENL=2
1110 IFLST=2THENIFPD=1THENL=3ELS
EIFLST=2THENIFPD=2THENL=4
1120 IFLST=3THENIFPD=1THENL=5ELS
EIFLST=3THENIFPD=2THENL=6
1130 CLS:GOSUB2300:IFPD=1THEN116
0ELSEGOSUB2690
1140 IFD>0THENSOUND7,5:PRINT@224
,"DELETED RECORD DETECTED.":PRIN
T"FOR HARDCOPY...":PRINT"FILES M
UST BE SORTED (OPT.5)":GOTO2250
1150 GOSUB1910:CLS:PRINT"NOW PRI
NTING...":PRINT#-2,CHR$(27)"@":P
RINT#-2
1160 GOSUB2990:FORR=1TOZ:GOSUB29
00:GOSUB2920:GOSUB2710
1170 IFL=1THENIFSC$=YR$THENPRINT
T3$;F1$;" ";LN$:C=C+1
1180 IFL=2THENIFSC$=YR$THENPRINT
#-2,TAB(8);T3$;F1$;" ";LN$;T4$;T
AB(50);CTY$;",";ST$:C=C+1
1190 IFL=3THENIFRC$=YR$THENPRINT
T3$;F1$;" ";LN$:C=C+1
1200 IFL=4THENIFRC$=YR$THENPRINT
#-2,TAB(8);T3$;F1$;" ";LN$;T4$;T
AB(50);CTY$;",";ST$:C=C+1
1210 IFL=5THENPRINTT3$;F1$;" ";L
N$;TAB(26);RC$;" ";SC$
1220 IFL=6THENPRINT#-2,TAB(8);T3
$;F1$;" ";LN$;T4$:PRINT#-2,TAB(8
);SN$;TAB(37);CTY$;",";ST$;"  ";
ZIP$;TAB(65);RC$;"    ";SC$:PRINT
#-2
1230 IFR/10=INT(R/10)ANDPD=1THEN
1250
1240 NEXTR:GOTO1280
1250 PRINT:PRINTTAB(6)"cONTINUE
OR sTOP ???"
1260 AN$=INKEY$:IFAN$=""THEN1260
ELSEIFINSTR("CS",AN$)=0THENSOUND
7,5:GOTO1260
1270 IFAN$="S"THEN1350ELSECLS:GO
SUB2300:GOSUB2990:GOTO1240
1280 IFL/2=INT(L/2)THENPRINT#-2:
PRINT#-2,TAB(8);Z" RECORDS ON FI
LE."
```

It's time we put our chips on the table

. . . and showed you our best deals on computer hardware.

HARDWARE SPECIALS

Extended Basic w/bk	$ 39.95
64k (DEI) Memory Upg	$ 59.95
Amdek Disk Drives	$499.95
26-3029 CoCo Drive 0	$309.95
26-3023 CoCo Drive 1	$239.95
HJL Keyboard (D,E,F,2)	$ 79.95
Super Pro Keybd. (D,E)	$ 64.95
26-3127 64K Extended CoCo2	**$179.95**
26-3134 16K Standard CoCo2	$ 89.95
26-3136 16K Extended CoCo2	$129.95
26-3801 Model 100 8K	**$349.95**
26-3816P 8K Upgrade Model 100	$ 69.95
26-1192 CGP-115 Printer/Plotter	$119.95
26-1276 DMP-105 Printer 80 cps	$179.95
C. Itoh 8510 AP Printer 120 cps	$399.95
Gorilla/NAP Video Monitor (Grn)	$109.95
Video Monitor Adapters	$ 29.95
26-3024 RS Multi-Pac Interface	$ 89.95
Botek Ser/Par Interface	$ 69.95

ACCESSORIES

RS D.C. Modem IB	$ 89.95
Novation J-Cat Modem	$129.95
RS D.C. Modem II	$179.95
USR Password 300	$179.95
Hayes SM 300 Modem	$239.95
USR Password 1200	$429.00
CoCo Switcher	$ 39.95
Elephant Disks ssdd	$ 22.95
26-3030 OS-9 (64k)	$ 64.95 (disk)
Basic-09 (req. OS-9)	$ 87.95 (disk)
"C" Compiler (OS-9)	$ 87.95 (disk)
FHL O-Pak (req. OS-9)	$ 34.95 (disk)
Elite Word	$ 59.95 (d&c)
Elite Calc	$ 59.95 (d&c)
Color Term Plus	$ 29.95 (cass)
Deft Pascal	$ 79.95
26-3012 Deluxe Joystick	$ 34.95

NEW! Dual Double Sided Drives including case, power supply & cable	**$475.00**
NEW! 26-3128 64K Direct Video CoCo2	**$219.95**

MSI SOFTWARE

MSI DISKUTIL	NEW	$19.95
COLOR FINANCE 1	RAINBOW CERTIFICATION SEAL	$49.95
COLOR FINANCE 11	NEW	$69.95
MSI NAMEFILE	RAINBOW CERTIFICATION SEAL	$24.95
MSI CALENDAR	NEW	$19.95

Call for prices and availability of your favorite software and hardware. All advertised items subject to availability. **Prices do not include shipping and handling.** All of the above units are covered by our 120 day carry-in warranty.

TRS-80 Trademark Tandy Corporation. Prices subject to change without notice.

TOLL FREE TENNESSEE 1-800-545-2502 TOLL FREE 1-800-251-5008

DELKER ELECTRONICS

DELKER ELECTRONICS, INC.
P.O. Box 897
Dept. R
408C Nissan Blvd.
Smyrna, TN 37167

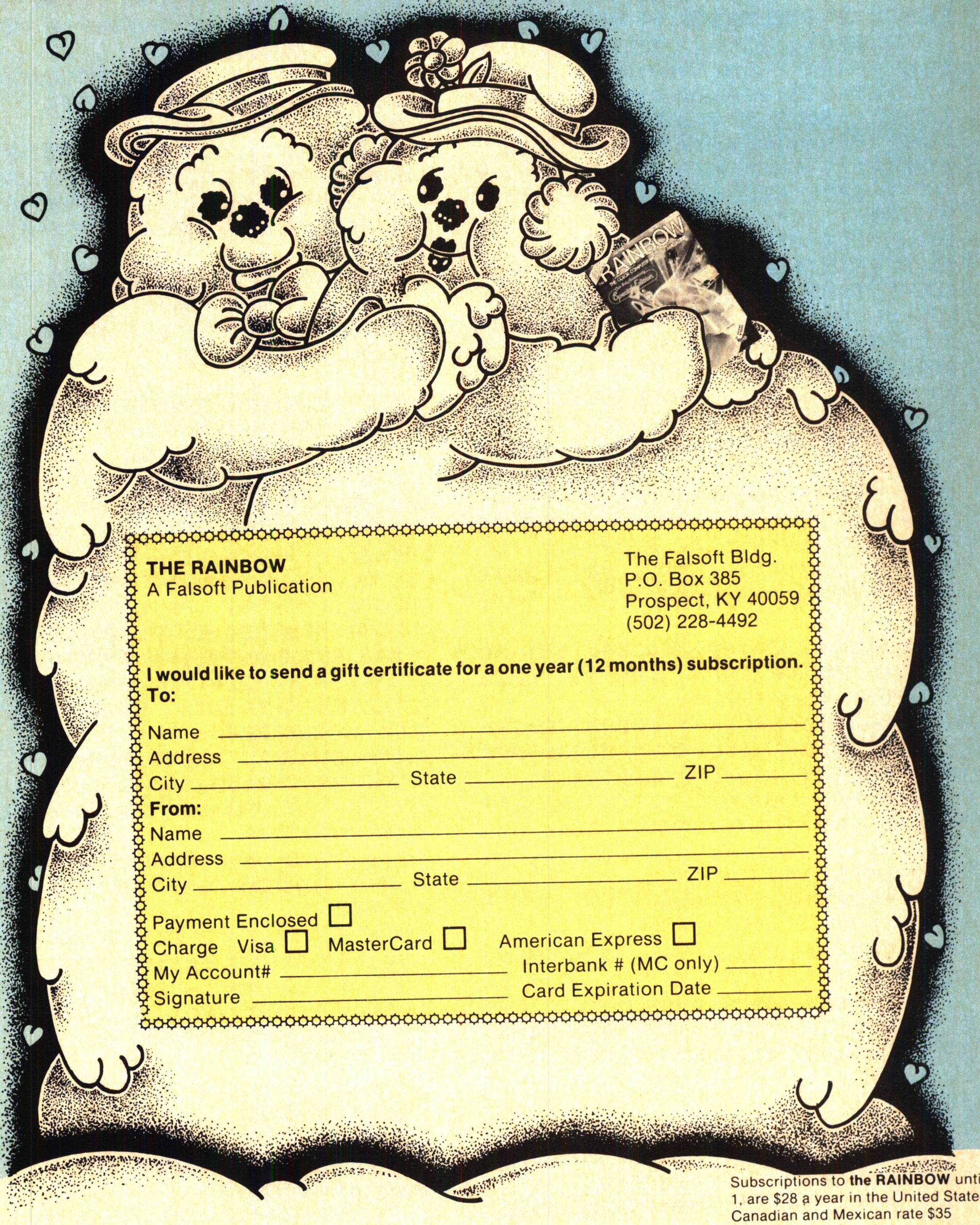
800-251-5008
800-251-2502 (TENNESSEE)
615-459-2636 (TENNESSEE)
615-254-0088 (NASHVILLE)

VISA MasterCard

Write for our FREE Newsletter!

```
1290 IFCNT=1THENIFL=2ORL=4THENPR
INT#-2:PRINT#-2,TAB(8);"NOTE: AB
OVE LIST EXCLUDES RECORDS FROM P
RIOR YEARS."
1300 GOSUB2300:POKE111,0:GOSUB23
50:GOSUB2370:CLS
1310 IFL<3THENPRINTC"CARDS SENT
IN 19";YR$ELSEIFL>2ANDL<5THENPRI
NTC"CARDS RECEIVED IN 19";YR$
1320 PRINT"TOTAL OF"Z"RECORDS ON
 FILE.":YY$=STR$(VAL(YR$)+1)
1330 IFLEFT$(YY$,1)=" "THENYY$=R
IGHT$(YY$,LEN(YY$)-1):GOTO1330
1340 IFCNT=1THENIFL=1ORL=3THENPR
INT:PRINT"ABOVE EXCLUDES THE 19"
;YY$;" LIST."
1350 IFLST=3THEN1390ELSEYX$=STR$
(VAL(YR$)-1)
1360 IFLEFT$(YX$,1)=" "THENYX$=R
IGHT$(YX$,LEN(YX$)-1):GOTO1360
1370 PRINT:PRINT"WANT A LISTING
FOR 19";YX$;" WHICH   WILL NOT I
NCLUDE THE 19";YR$;" NAMES ??? "
;:GOSUB2310:PRINTAN$:IFAN$="N"TH
EN1390
1380 C=0:CNT=1:YR$=YX$:GOTO1130
1390 GOTO2250
1400 '----- LABELS -----
1410 P=0:TS=1:TD=42:CLS(1):GOSUB
2300:COL=8:GOSUB3070:PRINT@73,"L
 A B E L E R";:GOSUB2650:GOSUB26
70:IFZ=0THEN2250
1420 GOSUB2320:PRINT@130,"LABEL
PAPER FORMAT :";:PRINT@162,"sING
LE OR dOUBLE COLUMN ?";
1430 LB$=INKEY$:IFLB$=""THEN1430
ELSEIFLB$="M"THEN310
1440 IFLB$="S"THENLB=1ELSEIFLB$=
"D"THENLB=2ELSESOUND7,5:GOTO1430
1450 PRINT@188,LB$;:GOSUB2330
1460 PRINT@258,"CURRENT YEAR (2-
DIGITS)? ";:LINEINPUTYR$:PRINT@2
87,CHR$(143+(16*(COL-1)));
1470 IFLEN(YR$)<>2ORVAL(YR$)=0TH
ENSOUND7,5:GOTO1460
1480 CLS:GOSUB2320:PRINT@132,"LA
BEL OUTPUT OPTIONS :":PRINT@166,
"(1) INDIVIDUAL LABEL":PRINT@198
,"(2) FULL RUN"
1490 PRINT@230,"(3) ZIP CODE":PR
INT@260,"SELECT (1-3) :";
1500 RN$=INKEY$:IFRN$=""THEN1500
ELSEIFINSTR("123M",RN$)=0THENSOU
ND7,5:GOTO1500
1510 PRINTRN$:RN=VAL(RN$):IFRN=0
THEN310
1520 CLS:GOSUB3120:IFRN<3THEN159
0
1530 CLS:PRINT@64,"ENTER TARGET
ZIP CODE...":PRINT"  ";:GOSUB257
0:ZP$=ZIP$
1540 GOSUB2320:PRINT@224,"WILL O
UTPUT BE...":PRINT"  (1) LOCAL,
OR":PRINT"  (2) NON-LOCAL":PRINT
"SELECT (1-2) :";
1550 LZ$=INKEY$:IFLZ$=""THEN1550
ELSEIFINSTR("12M",LZ$)=0THENSOUN
D7,5:GOTO1550
1560 PRINTLZ$:LZ=VAL(LZ$):IFLZ=0
THEN310ELSE1590
1570 LB=1:RT=0:CLS:PRINT"ENTER T
ARGET NAME";:GOTO640
1580 IFRT=1THEN2250ELSE1650
1590 PRINT:PRINT"TEST RUN FOR TA
B CHECK ? ";:GOSUB2310:PRINTAN$:
IFAN$="N"THENL=Z:TR$="N":GOTO164
0
1600 TR$="Y":PRINT:PRINT"LABEL T
EST...":L=LB+1:IFL>Z THENL=Z
1610 PRINT"THE FIRST "L"RECORDS
WILL BE":PRINT"OUTPUT.":GOSUB237
0:GOTO1650
1620 CLS:GOSUB2300:PRINT"TEST CO
NCLUDED...":GOSUB3120
1630 PRINT:PRINT"RE-RUN TEST ? "
;:GOSUB2310:PRINTAN$:IFAN$="Y"TH
EN1600ELSETR$="N":GOSUB2650:L=Z
1640 IFRN=1THEN1570
1650 IFP=0THENGOSUB1910
1660 CLS:PRINT"NOW PRINTING...":
:IFTR$="Y"THENPRINT"TEST RUN"ELS
EPRINT""
1670 IFP=0THENPRINT#-2,CHR$(27)"
O":FORX=1TO5:PRINT#-2:NEXT:P=1
1680 IFRN=1ANDTR$="N"THEN1700
1690 FORR=1TOL:IFTR$="Y"THEN1700
ELSEIFYR$<>RIGHT$(A$(R),2)THENCN
T=CNT+1:GOTO1790
1700 GOSUB2900:GOSUB2920:GOSUB27
10:IFRN=1ANDTR$="N"THEN1740
1710 IFRN=2THEN1740
1720 IFLZ=1THENIFZP$=ZIP$THEN174
0ELSEIFLZ=1THENIFZP$<>ZIP$THEN17
90
1730 IFLZ=2THENIFZP$<>ZIP$THEN17
40ELSE1790
1740 A=A+1:A1$(A)=T3$+F1$+" "+LN
$+T4$:A2$(A)=SN$:A3$(A)=CTY$+",
"+ST$+"     "+ZIP$:IFA< LB THEN20
80
1750 IFLB=2THEN1770
1760 PRINT#-2,TAB(TS);A1$(A):PRI
NT#-2,TAB(TS);A2$(A):PRINT#-2,TA
B(TS);A3$(A):GOTO1780
1770 GOSUB3100
1780 FORSP=1TO3:PRINT#-2:NEXT:A=
0:IFRN=1ANDTR$="N"THEN1820
1790 NEXTR:IFA=0THEN1820
```

It'sno job to give the perfect gift for this Christmas.



THE RAINBOW
A Falsoft Publication

The Falsoft Bldg.
P.O. Box 385
Prospect, KY 40059
(502) 228-4492

I would like to send a gift certificate for a one year (12 months) subscription.

To:

Name ____________________

Address ____________________

City ____________ State ____________ ZIP ________

From:

Name ____________________

Address ____________________

City ____________ State ____________ ZIP ________

Payment Enclosed ☐

Charge Visa ☐ MasterCard ☐ American Express ☐

My Account# ____________ Interbank # (MC only) ________

Signature ____________ Card Expiration Date ________

Get the ball rolling and fill out the form above to give someone a RAINBOW certificate in time for the holidays.

Subscriptions to **the RAINBOW** until Jan. 1, are $28 a year in the United States. Canadian and Mexican rate $35 U.S. Surface rate to other countries $65 U.S.; air rate $100 U.S. All subscriptions begin with the current issue. Please allow up to 5-6 weeks for first copy. U.S. FUNDS only.

Prices subject to change.

Just for your
TRS-80® Color
TDP System 100
Dragon-32
MC-10

```
1800 IFA<LBTHENA1$(2)="":A2$(2)=
"":A3$(2)="":GOSUB3100
1810 FORSP=1TO3:PRINT#-2:NEXT:A=
0
1820 POKE111,0:IFTR$="Y"THEN1620
1830 CLS:GOSUB2300:PRINT"PRINTIN
G FINISHED.":IFRN>1THEN1850
1840 PRINT:PRINT"ANOTHER LABEL ?
 ";:GOSUB2310:PRINTAN$:IFAN$="Y"
THENCLS:GOTO1570ELSE2250
1850 IFRN=2THENGOSUB2350:PRINT"T
OTAL OF"Z-CNT"LABELS PRINTED":PR
INT"FROM"L"RECORDS REVIEWED.":GO
TO2250
1860 IFLZ=2THEN1880
1870 PRINT:PRINT"OUTPUT WAS FOR
LOCAL TARGET ZIP CODE. WANT THE
NON-LOCAL LABELS RUN ? ";:LZ=2:G
OTO1890
1880 PRINT:PRINT"OUTPUT WAS FOR
NON-LOCAL LABELS.WANT LOCAL LABE
LS RUN ? ";:LZ=1
1890 GOSUB2310:PRINTAN$:IFAN$="Y
"THEN1650ELSE2250
1900 '----- PRINTER CHECK -----
1910 CLS:PRINT"** EPSON CODES AS
SUMED":PRINT"** TAB SETTINGS AUT
OMATIC":PRINT"** PERF. SKIP AUTO
MATIC":PRINT"** BAUD RATE = 9600
"
1920 GOSUB2320:PRINT@224,"SET PA
PER TO TOP OF FORM.":PRINT"PLACE
 PRINTER ON-LINE."
1930 PRINT@320,"==> PRESS <ENTER
> WHEN READY ";:LINEINPUTAN$:IFA
N$="M"THEN310ELSEPOKE65494,0
1940 X=PEEK(&HFF22):IF(X AND 1)=
1THENSOUND7,5:PRINTTAB(7)"printe
r";CHR$(128);"not";CHR$(128);"re
ady":GOTO1930
1950 POKE150,1:RETURN
1960 '----- DATA ENTRY -----
1970 CLS(1):GOSUB2300:COL=6:GOSU
B3070:PRINT@135,"D A T A  E N T
R Y";:GOSUB2650:GOSUB2670:IF Z=X
F THEN AN$="Y":GOTO2050ELSE R=Z
1980 PRINT@226,"ENTER CURRENT YE
AR : ";:LINEINPUTYR$:YR$=RIGHT$(
YR$,2)
1990 IFLEN(YR$)=2ORVAL(YR$)>0THE
N2000ELSESOUND7,5:PRINT"RE-ENTER
 AS DIGITS : ";:GOTO1980
2000 R=R+1:GOSUB2390:GOSUB2420:G
OSUB2480'NAME/ADDRESS
2010 GOSUB2400:GOSUB2600:GOSUB26
40:GOSUB2710'TITLE
2020 GOSUB2410:GOSUB2740'SND/REC
2030 GOSUB2820:GOSUB2850:GOSUB28
90'ARRAY
2040 GOSUB2300:PRINT@453,"MORE E
NTRIES (Y/N) ? ";:GOSUB2310:PRIN
TAN$
2050 IF AN$="Y" THEN IF R=XF OR
Z=XF THEN Z=R:SOUND7,5:PRINT:PRI
NT:PRINT TAB(5)"SORRY -- FILES F
ILLED":GOTO2250
2060 IFAN$="Y"THEN2000ELSEZ=R
2070 GOSUB2340:GOTO2250
2080 '----- SORT -----
2090 CLS(1):GOSUB2300:COL=7:GOSU
B3070:PRINT@66,"TAKE A BREAK !";
:PRINT@98,"SORT IN PROGRESS...";
:GOSUB2650:GOSUB2670:IFZ=0THEN22
50
2100 FORI=1TOZ:FORJ=I TO Z:IFA$(
I)<A$(J)THEN2120
2110 TEMP$=A$(I):A$(I)=A$(J):A$(
J)=TEMP$
2120 NEXTJ,I
2130 FORI=1TOZ:IFLEFT$(A$(I),1)=
CHR$(128)THENA$(I)=""
2140 NEXT:GOSUB2650
2150 GOSUB2300:CLS:PRINT@196,"SO
RT COMPLETE.":IFMM=6THEN2210ELSE
2250
2160 '----- FILE -----
2170 CLS(1):GOSUB2300:COL=2:GOSU
B3070:PRINT@75,"FILE MODE";:GOSU
B2650:GOSUB2670:IFZ=0THEN2250
2180 GOSUB2690:IFD>0THENSOUND7,5
:CLS:PRINT@224,"DELETED RECORD D
ETECTED.":PRINT"A SORT IS REQUIR
ED!!!"ELSE2200
2190 GOSUB2370:GOTO2090
2200 PRINT@130,"WANT TO SORT FIR
ST ?";:GOSUB2310:PRINTAN$;:IFAN$
="Y"THEN2090
2210 POKE65494,0:VERIFYON:OPEN"D
",#1,"TEMPCRD/DAT",75:FIELD#1,75
ASINFO$
2220 FORI=1TOZ:LSETINFO$=A$(I):P
UT#1:NEXT:CLOSE#1:VERIFYOFF
2230 KILL"XMASCRD/DAT":RENAME"TE
MPCRD/DAT"TO"XMASCRD/DAT"
2240 CLS:GOSUB2300:PRINT@64,"FIL
ING COMPLETE."
2250 PRINT:PRINT"    PRESS m FOR
 MAIN MENU"
2260 AN$=INKEY$:IFAN$=""THEN2260
ELSEIFAN$<>"M"THENSOUND7,5:GOTO2
260ELSEGOTO310
2270 PRINT@452,"";:INPUT"ARE YOU
 SURE ??";AN$:IFAN$<>"Y"ANDAN$<>
"N"THENSOUND7,5:GOTO2270ELSEIFAN
$="N"THEN310
2280 POKE65494,0:GOSUB2300:PRINT
"    PROGRAM TERMINATED -- BYE":E
ND
```

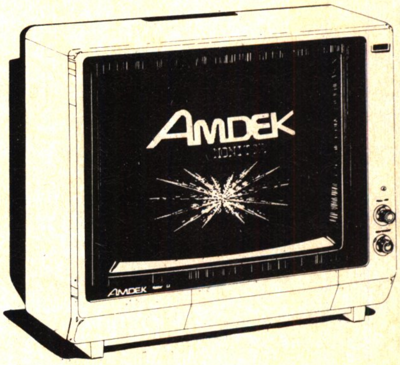
QUALITY SOFTWARE AND PERIPHERALS FOR YOUR COMPUTER

Skyline
MARKETING CORP

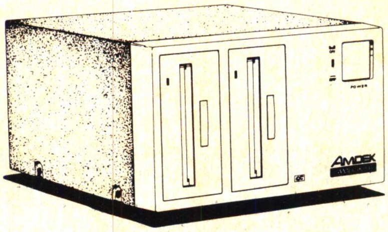
HOLIDAY HARDWARE HAPPENINGS!

MONITORS

Amdek Color I Plus Price Breakthrough—**$199** (suggested retail $379) Brilliant, vibrant, colors plus rich sound can be yours at a never-to-be-repeated price. 13″ tube, non-glare, with 18 mhz bandwidth. We made a special purchase of these factory-reconditioned monitors, and guarantee that you will find them satisfactory in every way or your money back! Each unit comes with a 30 day warranty and our 10 day Money Back Guarantee. But don't wait—this offer is strictly limited, and subject to availability!



Monitor Drivers for hookup of color monitor: specify original Color Computer, $24.95, or Color Computer 2, $39.95

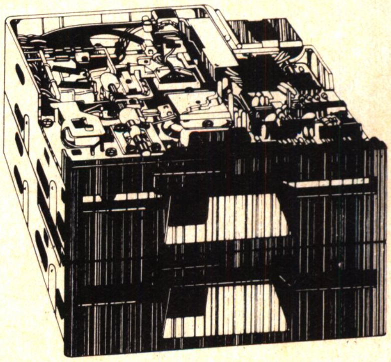


Skyline's Own Amber Hi-Res Save Big!—**$89** (suggested retail $149) High resolution, 18 mhz, 12″ non-glare amber monitor with P134 phosphor. Unmatched performance at an unheard of price! Limited supply, so order now!

Monitor Drivers for hookup of amber or green-screen monitors: specify original Color Computer or Color Computer 2, $24.95 each.

DISK DRIVES

5¼″ Double-Sided Drives like having a two-drive system, but for the price of one! Includes software (64K required) to access all 40 tracks on both sides, giving you 10 extra tracks for FREE. Ideal setup for OS-9 users. State of the art half-height drive in dual enclosure, with cable, just $259. With controller, only $389. For two double-sided 40 track drives in enclosure with cable, pay just $409 ($539 with controller).



Amdisk III B Dual 3″ drives you can't say enough good things about these compact, rugged units! Now, best of all, the price is great too! These are 'flippy' drives, allowing you to use both sides of the tough, reliable, diskettes. List price was $599—our price now is just $379, including cable and 2 FREE diskettes! System with disk controller available for $509.

UPS C.O.D. orders gladly accepted, $2.00 additional.

**We love Canadian orders!
Inquire for Foreign Shipping**

**FAST ORDER LINE (312) 286-0762
24 HOUR MODEM ORDER LINE (312) 286-9015**

Ordering Information
$10 shipping, handling and insurance on disk drives and monitors.

Skyline Marketing Corp. 4510 W. Irving Park Rd., Chicago, IL 60641

```
2290 '----- SUBROUTINES -----
2300 FORS=1TO2:SOUND180,2:NEXTS:
RETURN
2310 AN$=INKEY$:IFAN$=""THEN2310
ELSEIFINSTR("YN",AN$)=0THENSOUND
7,5:GOTO2310ELSERETURN
2320 PRINT@451,"(PRESS m FOR MAI
N MENU)";:RETURN
2330 PRINT@451,STRING$(23,32);:R
ETURN
2340 PRINT:PRINT"DATA ENTERED IN
 MEMORY...":RETURN
2350 PRINT:PRINT"END OF FILES...
":RETURN
2360 PRINT@418,"IF UNKNOWN -- PR
ESS <ENTER>":RETURN
2370 PRINT:PRINT"ANY KEY CONTINU
ES..."
2380 IFINKEY$=""THEN2380ELSERETU
RN
2390 CLS:GOSUB2300:PRINT"DATA EN
TRY";TAB(23);"REC ";R:PRINTSTRIN
G$(32,45):RETURN
2400 CLS:GOSUB2300:PRINTLN$;",";
F1$;TAB(23);"REC ";R:PRINTSTRING
$(32,45):RETURN
2410 CLS:GOSUB2300:PRINTT3$;F1$;
" ";LN$;T4$:PRINTSN$:PRINTCTY$;"
,";ST$;"  ";ZIP$:RETURN
2420 LINEINPUT"LAST NAME : ";LN$
:IFLEN(LN$)=0THENSOUND7,5:PRINT"
PLEASE ENTER ";:GOTO2420
2430 IFLEN(LN$)>12THENSOUND7,5:P
RINT"LIMIT TO 12 OR LESS CHRS":G
OTO2420
2440 LINEINPUT"FIRST NAME/MI : "
;F1$:IFLEN(F1$)=0THENSOUND7,5:PR
INT"PLEASE ENTER ";:GOTO2440
2450 IFLEN(F1$)>10THENSOUND7,5:P
RINT"LIMIT TO 10 OR LESS CHRS":G
OTO2440
2460 IFINSTR(F1$," ")=2ORINSTR(F
1$,".")=2THENSOUND7,5:PRINT"ENTE
R FULL NAME PLEASE!!!":GOTO2440
2470 RETURN
2480 GOSUB2400
2490 PRINT@64,"ADDRESS :":PRINT:
IFRU=2THENIFAN=5THEN2530
2500 LINEINPUT"STREET   : ";SN$:I
FLEN(SN$)=0THENSOUND7,5:PRINT"PL
EASE ENTER!!!":GOTO2500
2510 IFLEN(SN$)>21THENSOUND7,5:P
RINT"LIMIT TO 21 OR LESS CHRS":G
OTO2500
2520 IFRU=2THENRETURN
2530 LINEINPUT"CITY     : ";CTY$:
```

Parents! Want to stimulate your child's learning?

TCE'S EARLY LEARNING SERIES

ABC'S In Color
Speed your child's learning of the Alphabet!
CoCo 16K ECB Tape $19.95 Disk $25.95

Mr. Bear Count
A counting program that will tantalize the youngest member of your family!
CoCo 16K Tape $15.95 Disk $19.95

Alpha Memory
Your child can master the lower and upper case letters of the alphabet while having fun!
CoCo 16K Tape $16.95 Disk $20.95

Mr. Bear Math
Add & subtract with Mr. Bear. Your child will gain Mr. Bear's wink of praise & approval!
CoCo 16K Tape $15.95 Disk $19.95

Over 75 Titles!

Basic Math
Learn to add & subtract through counting!
CoCo 16K ECB Tape $12.95 Disk $16.95

Mr. Bear Flash Card
After your child has mastered Mr. Bear Math, continue his/her learning, experience with Mr. Bear's multiplication & division flash card.
CoCo 16K Tape $15.95 Disk $19.95

See & Spell
Let your computer aid your child in learning to spell!
CoCo 16K ECB Tape $14.95 Disk $18.95

Mix & Match
A brilliantly colored constantly moving computer version of concentration!
CoCo 16K Tape $12.95 Disk $16.95

Mr. Piggy
Program will aid your child in learning the value of money!
CoCo 32K ECB Tape $19.95 Disk $24.95

Teaching Clock
Learn to tell time with the aid of a special teaching clock!
CoCo 16K ECB Tape $16.95 Disk $19.95

Programs Have Been Child, Parent, & Educator Tested!

TCE ™

Send for FREE Catalog

TCE EDUCATION DIVISION
P.O. BOX 2477
GAITHERSBURG, MD 20879
(301) 963-3848

MasterCard VISA

```
IFLEN(CTY$)=0THENSOUND7,5:PRINT"
PLEASE ENTER!!!":GOTO2530
2540 IFLEN(CTY$)>15THENSOUND7,5:
PRINT"LIMIT TO 15 OR LESS CHRS":
GOTO2530
2550 LINEINPUT"STATE    : ";ST$:I
FLEN(ST$)=0THENSOUND7,5:PRINT"PL
EASE ENTER!!!":GOTO2550
2560 IFLEN(ST$)>5THENSOUND7,5:PR
INT"LIMIT TO 5 OR LESS CHRS":GOT
O2550
2570 LINEINPUT"ZIP      : ";ZIP$:
IFZIP$=""THENZIP$="      ":GOTO25
90
2580 IFLEN(ZIP$)<>5THENSOUND7,5:
PRINT"ERROR -- USE STD 5-DIGIT C
ODE":GOTO2570
2590 RETURN
2600 PRINT"DESIRED TITLE FOR LAB
EL :":PRINT:PRINT" (1)'MR & MRS'
 (2)'MR' (3)'MRS'"
2610 PRINT" (4)'MISS'      (5)'MS
' (6)-NONE-":PRINT"CHOICE (1-6)
? ";
2620 T1$=INKEY$:IFT1$=""THEN2620
ELSEIFINSTR("123456",T1$)=0THENS
OUND7,5:GOTO2620
2630 PRINTT1$:RETURN
2640 PRINT:PRINT"IS '& FAMILY' D
ESIRED (Y/N)?";:GOSUB2310:T2$=AN
$:PRINTT2$:RETURN
2650 FORZ=XF TO1STEP-1:IFA$(Z)="
"THENNEXT'LOF VERIFY
2660 RETURN
2670 IFZ=0THENSOUND7,5:CLS:PRINT
@164,"NO RECORDS ON FILE!!!"
2680 RETURN
2690 D=0:FORI=1TOZ:IFLEFT$(A$(I)
,1)=CHR$(128)THEND=D+1
2700 NEXT:RETURN
2710 IFT1$="1"THENT3$="Mr & Mrs
"ELSEIFT1$="2"THENT3$="Mr "ELSEI
FT1$="3"THENT3$="Mrs "ELSEIFT1$=
"4"THENT3$="Miss "ELSEIFT1$="5"T
HENT3$="Ms "ELSEIFT1$="6"THENT3$
=""
2720 IFT2$="Y"THENT4$=" & Family
"ELSET4$=""
2730 RETURN
2740 PRINT:PRINT"ENTER YEAR AS 2
-DIGITS **":GOSUB2360
2750 PRINT@192,"LAST YEAR CARD R
EC'D ? ";
2760 LINEINPUTRC$:IFRC$=""THENRC
$="??":GOTO2780
2770 IFLEN(RC$)<>2ORVAL(RC$)=0TH
```

QUALITY SOFTWARE AND PERIPHERALS FOR YOUR COMPUTER

Skyline
MARKETING CORP

$60 Software Bonus With Memory Upgrade

That's right—Skyline's famous 64K Upgrade is an even better deal than before! 8 guaranteed 200 n.s. 64K memory chips, solderless installation instructions (one solder connection required on Color Computer 2), Skyline's 64K BOOT and PAGER programs, PLUS the Wizard 64 adventure game, PLUS a handy new utility, SETUP 64 (allows you to configure your tape or disk system in a myriad of ways!) Still only $59.95. Order now—this offer may be withdrawn at any time!

Skyline Software

Super Stats	$29.95
Page Plus (improved doc) tape	$27.95
Page Plus disk	$29.95
Structured Macros	$19.95
C.C. Three	$49.95
SETUP 64	$19.95
MDISK (source code included)	$27.95
MDISK disk	$29.95

Skyline Software

ROMBACK	$16.95
Mystic Mansion (disk)	$29.95
QUICKSORT (cassette)	$12.95
64K BOOT/Pager	$19.95
Wizard's Tomb	$12.95
Wizard 64 tape	$21.95
Wizard 64 disk	$23.95
Simplex	$29.95
C.C. Mailer	$19.95

Call for the latest prices on:

- ***monitors*** by AMDEK & NEC
- ***printers*** by STAR, NEC, OKIDATA TELEVIDEO, JUKI & TRANSTAR
- ***modems*** by HAYES & NEC
- ***disk drives*** by AMDEK and more...

Money orders, Visa and Master Card and UPS C.O.D. orders gladly accepted, $2.00 additional.

MODEM ORDER LINE: 312 • 286-9015
Dealer inquiries invited

**Skyline Marketing Corp.
4510 W. Irving Park Rd.
Chicago, IL 60641
312 • 286-0762**

OWLS NEST
SOFTWARE
' WE GIVE A HOOT '

LABELIII (Reviewed in Nov. '83 Rainbow)
CHRISTMAS IS JUST AROUND THE CORNER!
Let your computer and **LABELIII** create your Christmas card list. With **LABELIII** you can develope and maintain a mailing list. Print lists or mailing labels in your choice of 1, 2, or 3 wide. Supports 3 or 4 line addresses with phone optional, FAST machine language sort by last name, first name, or zip code.
Cassette 16K EXT - Postpaid $19.95

FILEIII - Data Management System
With **FILEIII** you can create and maintain records on anything you choose. Recipes, coupons, household records, financial records - you name it. You create records containing up to five fields you define. You can search, sort, modify, delete, save on tape and display on the screen or send to a printer. The program is user friendly and user proof. Prompting is extensive. A comparable program could cost much more. This one is a bargin!
Cassette 16K EXT - Postpaid $19.95

PROGRAM FILE (Reviewed in Oct. '83 Rainbow)
Organize your cassette programs. With **PROGRAM FILE** you create a file of your computer programs. You can search, sort, modify, add, delete, save on tape, and display on screen or printer.
Cassete 16K EXT - Postpaid $14.95

NEW!!
INTRODUCING! - CODE CONVERTER Secrurity System
CODE CONVERTER will protect your basic and ML programs from unauthorized use. A simple code of your choice encodes your programs. Basic program listings will be scrambled and inoperative. Machine Language will not operate. Coded programs can be copied but are useless untill properly decoded.
Cassette 16K EXT - Postpaid $19.95

ADVENTURE STARTER (Reviewed in Feb.'84 Rainbow)
Learn to play those adventures the painless way. You start with a simple adventure and move into an intermediate. Two complete seperate adventures plus hints and tips on adventuring. Finish this and you are ready for **ATLANTIS**!
Cassette 16K Ext - Postpaid $17.95

ATLANTIS ADVENTURE (Reviewed in May'84 Rainbow)
This one is tough! We challenge you to complete this in 30 days! If you can we will send you any program we sell - Postpaid - at absolutely no charge. You start on a disabled sub near the lost city of Atlantis. You must get the sub (and yourself) safely to the surface.
Cassete 16K EXT - Postpaid $21.95

ESPIONAGE ISLAND ADVENTURE (Reviewed June'84)
You have been dropped off on a deserted island by submarine. You must recover some top secret microfilm and signal the sub to pick you up. Problems abound in this 32K adventure.
32K EXT - Postpaid Disk - $20.95 Cassette $17.95

KINGDOM OF BASHAN
Our most involved adventure to date. Bashan has a large vocabulary and some unique problems to solve. You must enter **BASHAN** (not easy), gather the ten treasures of the kingdom while staying alive (even harder), and return to the starting point (harder yet). If you can get the maximum 200 points in this you are an expert!
32K EXT - Postpaid Disk - $20.95 Cassette $17.95

FOUR MILE ISLAND (Reviewed May '84)
You are trapped inside a disabled nuclear power plant. The reactor is running away! You must bring the reactor to a cold shutdown and prevent the "China Syndrome". Can you save the plant (and yourself)? It's not easy!
Cassette 16K EXT - Postpaid $17.95

*C.O.D. orders please add $1.50
*No delay for personal checks

IN A HURRY? CALL OUR HOOT LINE: (615) 238-9458

VISA®
OWLS NEST SOFTWARE
P.O. BOX 579, OOLTEWAH, TN 37363
MasterCard

```
ENSOUND7,5:PRINT"RE-ENTER : ";:G
OTO2760
2780 IFRU=2THENIFAN=6THENRETURN
2790 PRINT@418,STRING$(32,32):PR
INT@256,"SEND CARD THIS YEAR (Y/
N) ? ";:GOSUB2310:PRINTAN$:IFAN$
="Y"THENSC$=YR$:GOTO2810
2800 SC$=SC$:IFSC$=""THENSC$="??
"
2810 RETURN
2820 NAM$=LN$+","+F1$
2830 IFLEN(NAM$)<23THENNAM$=NAM$
+" ":GOTO2830
2840 RETURN
2850 IFLEN(SN$)<21THENSN$=SN$+"
":GOTO2850
2860 IFLEN(CTY$)<15THENCTY$=CTY$
+" ":GOTO2860
2870 IFLEN(ST$)<5THENST$=ST$+" "
:GOTO2870
2880 RETURN
2890 A$(R)=NAM$+SN$+CTY$+ST$+ZIP
$+T1$+T2$+RC$+SC$:RETURN
2900 NAM$=LEFT$(A$(R),23):X=INST
R(NAM$,","):LN$=LEFT$(NAM$,X-1):
F1$=RIGHT$(NAM$,LEN(NAM$)-X)
2910 IFRIGHT$(F1$,1)=" "THENF1$=
LEFT$(F1$,LEN(F1$)-1):GOTO2910EL
SERETURN
2920 SN$=MID$(A$(R),24,21):CTY$=
MID$(A$(R),45,15)
2930 IFRIGHT$(CTY$,1)=" "THENCTY
$=LEFT$(CTY$,LEN(CTY$)-1):GOTO29
30
2940 ST$=MID$(A$(R),60,5)
2950 IFRIGHT$(ST$,1)=" "THENST$=
LEFT$(ST$,LEN(ST$)-1):GOTO2950
2960 ZIP$=MID$(A$(R),65,5)
2970 T1$=MID$(A$(R),70,1):T2$=MI
D$(A$(R),71,1):RC$=MID$(A$(R),72
,2):SC$=RIGHT$(A$(R),2)
2980 RETURN
2990 IFL=1THENPRINT"CARDS SENT I
N 19";YR$:PRINTSTRING$(32,45)
3000 IFL=2THENPRINT#-2,TAB(18);C
HR$(14);"CARDS SENT IN 19";YR$;C
HR$(20):PRINT#-2
3010 IFL=3THENPRINT"CARDS RECEIV
ED IN 19";YR$:PRINTSTRING$(32,45
)
3020 IFL=4THENPRINT#-2,TAB(14);C
HR$(14);"CARDS RECEIVED IN 19";Y
R$;CHR$(20):PRINT#-2
3030 IFL=5THENPRINT@9,"xmas card
 file":PRINT:PRINT"name";TAB(26)
;"r  s":PRINT
```

```
3040 IFL=6THENPRINT#-2,TAB(26);C
HR$(14);"XMAS CARD FILE";CHR$(20
):PRINT#-2
3050 IFL=6THENPRINT#-2,TAB(64);"
REC  SND"
3060 RETURN
3070 X=143+(16*(COL-1)):FORH=102
4TO1055:POKEH,X:NEXT:FORH=1504TO
1535:POKEH,X:NEXT
3080 FORV=1056TO1472STEP32:POKEV
,X:NEXT:FORV=1087TO1503STEP32:PO
KEV,X:NEXT
3090 RETURN
3100 PRINT#-2,TAB(TS);A1$(1);TAB
(TD);A1$(2):PRINT#-2,TAB(TS);A2$
(1);TAB(TD);A2$(2):PRINT#-2,TAB(
TS);A3$(1);TAB(TD);A3$(2)
3110 RETURN
3120 PRINT@64,"TAB SETTINGS ARE
:":PRINT"  FIRST COLUMN    "TS:IF
LB=2THENPRINT"  SECOND COLUMN  "
TD
3130 PRINT:PRINT"CHANGE TAB SETT
ING ? ";:GOSUB2310:PRINTAN$:IFAN
$="N"THEN3150
3140 PRINT:INPUT"NEW COL.ONE TAB
";TS:IFLB=2THENINPUT"NEW COL.TWO
 TAB";TD
3150 RETURN
3160 '----- COVER PAGE -----
3170 POKE65495,0:CLS(2):FORH=0TO
63STEP4:FORV=0TO31:SET(H,V,4):NE
XTV,H
3180 P=66:FORH=1TO11:PRINT@P,STR
ING$(28,207);:P=P+32:NEXT
3190 P=117:FORH=1TO3:PRINT@P,STR
ING$(7,175);:P=P+32:NEXT
3200 PRINT@117,"20";:PRINT@122,"
CT";:PRINT@183,"usa";
3210 PRINT@231,"  XMAS CARD FILE
  ";:PRINT@263," & LABELER (V2.0
) ";:PRINT@295,"      (C) 1984
  ";
3220 PRINT@327," BY:JAMES D. BAL
L ";:PRINT@359,"  UNIONTOWN,OHIO
  ";:PRINT@5," ALL RIGHTS RESERV
ED ";
3230 PRINT@451," INSERT DATA DIS
KETTE...  ";:GOSUB2300:PRINT@484
,"PRESS <ENTER> WHEN READY ";
3240 SET(6,30,1):FORT=1TO75:NEXT
T:RESET(6,30):FORT=1TO75:NEXTT
3250 IFINKEY$<>CHR$(13)THEN3250
3260 POKE65494,0:RETURN
3270 '----- END XMAS CARD FILE -
----
```

TRS-80 COMPUTER DISCOUNTS

COLOR COMPUTERS

*26-3134 16k color II	89.95
*26-3136 16k ext color II	125.00
*26-3127 64k color comp	175.00
26-3029 1st disk drive	289.95
26-1161 2nd disk drive	229.95

PRINTERS

26-1271 DMP-110	299.95
26-1254 DMP-200	510.00
26-1255 DMP-120	395.00
26-1257 DWP-210	500.00

MODEL 4 and 100's

26-1067 mod 4 16k	699.95
26-1068 mod 4 64k 1 dr.	900.00
26-1069 mod 4 64k 2dr.	1020.00
26-1080 mod 4 p	1020.00
26-3801 mod 100 8k	499.95
26-3802 mod 100 24k	619.95

*Prices good through 11-25-84

We Carry the Complete Line of TRS-80 Computer Products at Discount Prices

CALL FOR A FREE PRICE LIST 800-257-5556
IN N.J. CALL 609-769-0551

WOODSTOWN ELECTRONICS
Rt. 40 E. WOODSTOWN, N.J. 08098

CALINDEX®
The automated computer calendar

December 1984
19 Wednesday December 1984
19
DAILY 1985
CALINDEX
For The Color Computer*
MASTER DISK
Gratham Software Co.
702 W Washington St
Marina del Rey, Ca. 90292

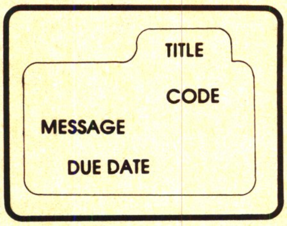
This Year Give the Calendar Packed with Power

CALINDEX®
The automated computer calendar

If you use a calendar you need Calindex

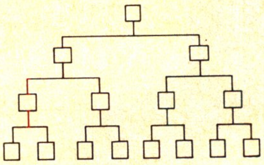
Use Calindex every day and . . .

- always know what's coming due.
- never miss an important deadline.
- feel secure everyone is up to date.
- have a permanent record of activities.



So easy to use

Once you enter a due date and other information on a file card **Calindex** starts reminding you a month in advance of upcoming items. And **Calindex** keeps reminding you until you tell it the item is taken care of. The power of **Calindex**.



So automatic

A chain of command feature allows each member of your group to have a personal code. **Calindex** will even report seriously overdue items up the "chain of command" until they are taken care of down the line. Again, the power of **Calindex**.

The power of Calindex

Indespensible for every . . .

* Family * Committee * Group *
* Business * Club * Organization *
* Student * Parent * Teacher *

$35.00
SPECIAL HOLIDAY PRICE

Grantham Software Division
702 W. Washington Street
Marina del Rey, CA 90292
(213) 827-8087

CALINDEX®
The automated computer calendar

Grantham Software Division
702 W. Washington Street
Marina del Rey, CA 90292

YES! RUSH me my copy of Calindex for CoCo.

Name ______________________

Address ______________________

City __________ **State** __________ **ZIP** __________

☐ **1My check for $35.00 is enclosed (California residents add 6.5% sales tax).**

☐ **Please send personalized card** ☐ **Hannakah** ☐ **Christmas**

From ______________________

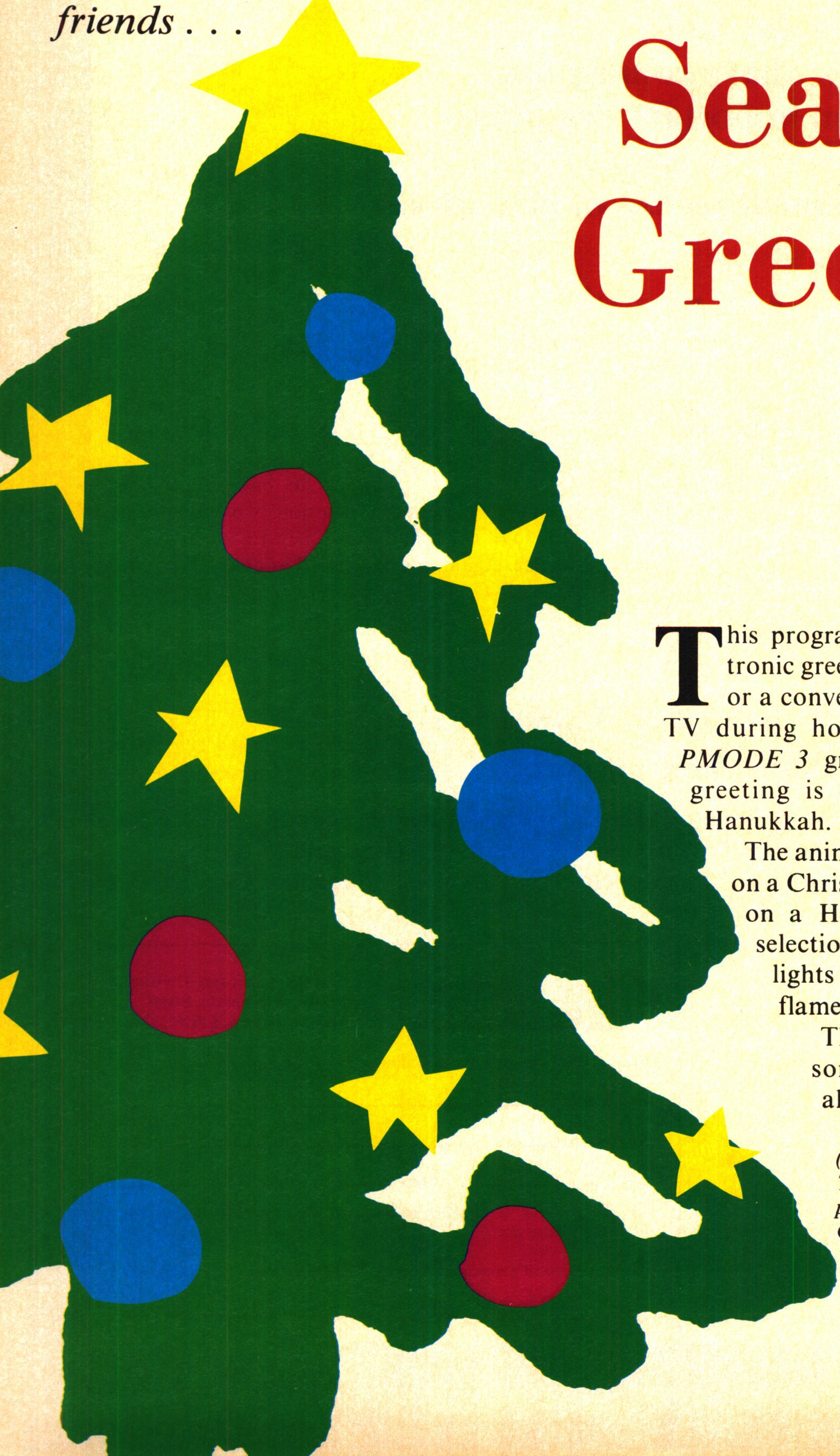
HOLIDAY GRAPHICS

16K ECB

A Christmas and Hanukkah message from you to your friends . . .

Season's Greetings

By Joseph Kohn



This program can be either an ideal electronic greeting card for your CoCo friends or a conversation piece for display on the TV during holiday get-togethers. Utilizing *PMODE 3* graphics, a four-color animated greeting is conveyed for Christmas and Hanukkah.

The animation consists of blinking lights on a Christmas tree and flickering candles on a Hanukkah menorah. A random selection of *PSET* instructions for the lights and *DRAW* instructions for the flames achieves the desired effect.

There are two provisions for personalizing the greeting. Line 40 allows any desired message to be

---

(Joseph Kohn is a systems engineer for TRW at Norton AFB. He is currently president of the Citrus Color Computer Club.)

displayed briefly on the text screen. The bottom line on the high resolution graphics screen provides the second personal touch. In Line 980 you may substitute your own 20-character message in place of "From the Kohn Family." If you need more characters, you can change the scale factor from S8 to S4. The A$() array provides the *DRAW* strings for all ASCII characters, so feel free to be creative. Season's Greetings!

170	166
370	133
540	211
770	251
930	151
1080	239
END	142

The listing:

```
10 'JOSEPH KOHN
20 '1343 BLOSSOM AVE.
30 'REDLANDS, CA 92373
40 CLS:PRINT@99,"TO":PRINT@132,"
THE":PRINT @165,"SMITH'S":PRINT@
262,"FROM":PRINT @295,"JOE":PRIN
T @328,"LINDA":PRINT@361,"LISA":
PRINT@394,"MICHELLE":SCREEN0,1
50 FORX=1TO2000:NEXT
60 DIM A$(90)
70 A$(33)="U4E2F2D2NL4D2BR3" 'A
80 A$(34)="U6R3F1D1G1NL3F1D1G1L3
BR7" 'B
90 A$(35)="BR3E1BU4H1L2G1D4F1R2B
R4"'C
100 A$(36)="U6R3F1D4G1L3BR7" 'D
110 A$(37)="R4BU6L4D3NR2D3BR7" '
E
120 A$(38)="U6NR4D3NR2D3BR7" 'F
130 A$(39)="BR4BU5H1L2G1D4F1R3U2
NL1D2BR3" 'G
140 A$(40)="U6D3R4U3D6BR3" 'H
150 A$(41)="BU6BR1R2L1D6L1R2BR4"
 'I
160 A$(42)="BU1F1R2E1U5BD6BR3"
'J
170 A$(43)="U6D3R1NE3F3BR3" 'K
180 A$(44)="NU6R4BR3" 'L
190 A$(45)="U6F2ND1E2D6BR3" 'M
200 A$(46)="U6F4U4D6BR3" 'N
210 A$(47)="BU1U4E1R2F1D4G1L2NH1
BR6" 'O
220 A$(48)="U6R3F1D1G1L3BF3BR4"
'P
230 A$(49)="BU1U4E1R2F1D3G1NH1NF
1G1L1NH1BR6" 'Q
240 A$(50)="U6R3F1D1G1L3R1F3BR3"
 'R
250 A$(51)="R3E1U1H1L2H1U1E1R3BD
6BR3" 'S
260 A$(52)="BU6R4L2D6BR5" 'T
270 A$(53)="BU1U5BR4D5G1L2NH1BR6
" 'U
280 A$(54)="BU4NU2F1D1F1ND1E1U1E
1U2BD6BR3" 'V
290 A$(55)="NU6E2F2NU6BR3" 'W
300 A$(56)="U1E4U1BL4D1F4D1BR3"
'X
310 A$(57)="BU6D1F2E2U1D1G2D3BR5
" 'Y
320 A$(58)="U1E4U1L4BD6R4BR3" 'Z
330 A$(65)="BU4R2F1D1L2G1F1R2NU2
R1BR3" 'a
340 A$(66)="U6D2R3F1D2G1L3BR7" '
b
350 A$(67)="BU4BR2NF1L2G1D2F1R2N
E1BR4" 'c
360 A$(68)="BU4BR4L3G1D2F1R3NU6B
R3" 'd
370 A$(69)="BR3L2H1U2E1R2F1D1NL4
BD2BR3" 'e
380 A$(70)="BR1U3NL1NR1U2E1R1F1B
D5BR3" 'f
390 A$(71)="BD2R3E1U5L3G1D2F1R3B
R3" 'g
400 A$(72)="U6D3E1R2F1D3BR3" 'h
410 A$(73)="BU6BR1R1BD2NL1D4L1R2
BR4" 'i
420 A$(74)="BU6BR3R1BD2NL1D5G1L2
H1U1BR7" 'j
430 A$(75)="U6D3R1NE2F3BR3" 'k
440 A$(76)="BU6BR1R1D6L1R2BR4" '
l
450 A$(77)="U4D1E1F1ND3E1F1D3BR3
" 'm
460 A$(78)="U4D1E1R2F1D3BR3" 'n
470 A$(79)="BU1U2E1R2F1D2G1L2NH1
BR7" 'o
480 A$(80)="D2U6R3F1D2G1L3BR7" '
p
490 A$(81)="BD2BR4U6L3G1D2F1R3BR
3" 'q
500 A$(82)="U4D1E1R2F1BD3BR3" 'r
510 A$(83)="R3E1H1L2H1E1R3BD4BR3
" 's
520 A$(84)="BU5R4L2U1D5F1E1BD1BR
3" 't
530 A$(85)="BU4D3F1R2NU4R1BR3" '
u
540 A$(86)="BU4F1D1F1ND1E1U1E1BD
4BR3" 'v
550 A$(87)="BU4D3F1E1NU2F1E1U3BD
4BR3" 'w
560 A$(88)="E4BL4F4BR3" 'x
570 A$(89)="BU4D3F1R3U4D5G1L3BU2
```

```
BR7" 'y
580 A$(90)="BU4R4G4R4BR3" 'z
590 A$(0)="BR2"'SPACE
600 A$(1)="BR1R1BU2U4BD6BR5" '!
610 A$(2)="BU6BR1ND2BR2D2BD4BR4"
 'QUOTES
620 A$(3)="BU2NR4BU2NR4BU2BR1ND6
BR2D6BR4" '#
630 A$(4)="BR2U6D1R2L3G1F1R2F1G1
L3BD1BR7" '$
640 A$(5)="U1E4U1BL3D1L1U1R1BD6B
R2R1U1L1D1R1BR3" '%
650 A$(6)="BU1U1E2U1H1G1D1F3NE1N
F1G1L1NH1BR6" '&
660 A$(7)="BR2BU4U2BD6BR5" ''
670 A$(8)="BR2H2U2E2BD6BR3" '(
680 A$(9)="E2U2H2BD6BR7" ')
690 A$(10)="BR2BU3NL2NR2ND2NU2NE
1NF1NG1NH1BD3BR5" '*
700 A$(11)="BU3R4L2U2D4BD2BR5" '
+
710 A$(12)="U1R1D1NL1D1G1BU2BR7"
 'COMMA
720 A$(13)="BU3R4BD3BR3" '-
730 A$(14)="U1R1D1L1BR7"'.
740 A$(15)="U1E4U1BD6BR3" '/
750 A$(16)="BU1U4E1R1F1D4G1L1NH1
BR6"
760 A$(17)="BU6BR2NG1D6L1R2BR4"
'1
770 A$(18)="BU5E1R2F1D1G1L2G1D2R
4BR3" '2
780 A$(19)="BU5E1R2F1D1G1NL1F1D1
G1L2NH1BR6" '3
790 A$(20)="BU2U1E3D4NR1NL3D2BR4
" '4
800 A$(21)="BU1F1R2E1U2H1L3U2R4B
D6BR3" '5
810 A$(22)="BU6BR3L1G2D3F1R2E1U1
H1L3BD3BR7" '6
820 A$(23)="BU6R4D1G4D1BR7" '7
830 A$(24)="BU1U1E1R2E1U1H1L2G1D
1F1R2F1D1G1L2NH1BR6" '8
840 A$(25)="BR1R1E2U3H1L2G1D1F1R
3BD3BR3" '9
850 A$(26)="U1R1D1L1BU3U1R1D1L1B
D3BR7" ':
860 A$(27)="U1R1D1L1BU3U1R1D1L1B
D5E1U1BR6" ';
870 A$(28)="BU3NE3F3BR4" '<
880 A$(29)="BU2NR4BU2R4BD4BR3" '
=
890 A$(30)="E3H3BD6BR7" '>
900 A$(31)="BR1R1BU2E2U1H1L2G1BD
5BR7" '?
910 A$(32)="BR4L2H2U2E2R1F1D2G1L
1H1E1R2BD4BR3" '@
920 GOTO940
930 FORX1=1TO LEN(X$):Y1=ASC(MID
$(X$,X1,1))-32:DRAW"XA$(Y1);":NE
XT:RETURN
940 PMODE3,1:PCLS2:SCREEN1,0
950 COLOR3:LINE(8,20)-(126,170),
PSET,BF
960 COLOR4:LINE(128,20)-(246,170
),PSET,BF
970 X$="SEASONS  GREETINGS":DRAW
 "BM14,16;C4S8":GOSUB930
980 X$="From the Kohn Family":DR
AW "BM2,186;S8C3":GOSUB930
990 COLOR1:LINE(64,36)-(20,156),
PSET:LINE-(60,156),PSET:LINE-(60
,168),PSET:LINE-(68,168),PSET:LI
NE-(68,156),PSET:LINE-(106,156),
PSET:LINE-(64,36),PSET
1000 PAINT(64,40),1,1
1010 COLOR2:LINE(188,36)-(168,68
),PSET:LINE-(208,68),PSET:LINE-(
188,36),PSET:LINE(168,48)-(188,8
0),PSET:LINE-(208,48),PSET:LINE-
(168,48),PSET
1020 DRAW"BM188,100;C3S4;R2D16R4
U8R4D8R4U8R4D8R4U8R4D8R4U8R4D12G
20D8R8D8L28"
1030 DRAW"BM188,100;C3S4;L2D16L4
U8L4D8L4U8L4D8L4U8L4D8L4U8L4D12F
20D8L8D8R28"
1040 PAINT(188,102),3,3
1050 COLOR2:LINE(64,24)-(56,38),
PSET:LINE-(72,28),PSET:LINE-(56,
28),PSET:LINE-(72,38),PSET:LINE-
(64,24),PSET
1060 PAINT(64,30),2,2
1070 Y=107:FORX=156 TO 180STEP8:
GOSUB1140:NEXT:FORX=196 TO 220ST
EP8:GOSUB1150:NEXT:Y=99:X=188:GO
SUB1140
1080 DRAW "BM32,44;C2R4D4R4D4L4D
8L4U8L4U4R4U4"
1090 Y=107:X=148+RND(4)*8:IF RND
(2)=1 GOSUB 1140 ELSE GOSUB 1150
1100 Y=107:X=188+RND(4)*8:IF RND
(2)=1 GOSUB 1140 ELSE GOSUB 1150
1110 Y=99:X=188:IF RND(2)=1 GOSU
B 1140 ELSE GOSUB 1150
1120 PSET(60,68,RND(3)):PSET(80,
86,RND(3)):PSET(64,92,RND(3)):PS
ET(44,108,RND(3)):PSET(68,128,RN
D(3)):PSET(92,144,RND(3)):PSET(8
8,112,RND(3)):PSET(49,140,RND(3)
)
1130 GOTO1090
1140 DRAW"BM"+STR$(X)+","+STR$(Y
)+"C2U4D3L2U5R2C4ND1R2D2C2D3L2":
RETURN
1150 DRAW"BM"+STR$(X)+","+STR$(Y
)+";C2U4D3L1U4C4NU2R2NU2R2C2U1D5
L2":RETURN
```

SQUEEZE MORE OUT OF EVERY ON-LINE MINUTE.

CompuServe Software
VIDTEX

WITH NEW VIDTEX™ COMMUNICATIONS SOFTWARE FROM COMPUSERVE.

Presenting the software package that makes your Tandy® Color Computer more productive and cost-efficient.

New Vidtex™ from CompuServe has unparalleled intelligence to let your computer communicate more efficiently and economically with most bulletin boards and time sharing services (including CompuServe's Information Service).

Here are just a few of the features Vidtex provides to bring your on-line hours in line.

Auto-Logon. Lets you log on quickly and simply by utilizing prompts and responses pre-defined by you. Also allows initiation of command files after logging on.

Error-Free Uploading and Downloading. CompuServe "B" Protocol contained in Vidtex lets you transfer to or from disk or cassette and CompuServe host with guaranteed data integrity despite line noise. Also provides error-free downloading from CompuServe's extensive software libraries, including the Color Computer SIG (GO COCO) and Rainbow on Tape (GO SOFTEX).

10 Function Keys. Let you consolidate long commands into single keystrokes. Definitions can be saved to and loaded from disk, allowing multiple definitions for different applications.

Capture Buffer. Saves an on-line session in memory to review or use later. Contents can be loaded from or saved to disk; displayed both on and off line; or dumped to your printer at any baud rate.

On-Line Graphics. Feature run-length compression for faster transmissions. Displays stock charts, weather maps and more.

Full ASCII Keyboard. All 128 ASCII characters can be generated, as well as many built-in local functions, such as inverse video, disk directory, communications parameters, etc.

Timely Updates. Keep you informed on latest Vidtex developments at low cost.

New Vidtex is available on disk (#55122) or cassette (#55123) for only $39.95. Both versions require a 32K Color Computer or CoCo II (cassette or disk drive) and a 300 baud modem.

If you are already a CompuServe subscriber, you can order Vidtex on line by using the GO ORDER command. Otherwise, check with your nearest computer dealer; or to order direct, call or write:

CompuServe

P.O. Box 20212, 5000 Arlington Centre Blvd,
Columbus, Ohio 43220

1-800-848-8199

In Ohio, call 614-457-0802

An H&R Block Company.

Vidtex is a trademark of CompuServe, Incorporated. Tandy is a trademark of Tandy Corp.

ADVENTURE CONTEST

Presenting the winners of the Second Annual Rainbow Adventure Contest . . .

The VOTE Is In

By Kevin Nickols

Computer Adventure games: There are those of us who believe that no other type of game ever created can compare favorably. They really are remarkable. Like a lot of other people, I have been hooked since the first time I punched GO NORTH into a Color Computer keyboard. For this reason above others, I was quite pleased to be invited to coordinate the judging of the Second Annual RAINBOW Adventure Contest.

Since then, the word "overwhelmed" has taken on a whole new meaning for me.

Nearly 150 programs were received as entries into this year's contest from nearly every state in the union and from several countries around the globe. This is surely one of the largest — perhaps *the* largest — collections of computer Adventure games ever assembled. In any language. For any machine. On any planet.

Now try to imagine, if you will, making it through that many Adventures with an eye towards the best. Nearly 150 programs, and almost every one of them packing 32K of RAM up to the CoCo's heat vents! Can the magnitude be translated? I mean, this is not like tasting wine or watching a swim suit competition. These things take *days* to solve and evaluate!

But the judges have persevered (although we lapse now and then into verb/noun speech), and we are now able to announce the winners of the contest: those 18 Adventures that were judged to be the best conceived and best constructed of all the entries. Not only do these programmers deserve the prizes that they have received, but they also deserve a tremendous amount of recognition for the hard work, knowledge and skill that they have applied toward their creations.

There may be some debate in Adventure circles as to whether graphics programs are truly better than the all-text games. Many people prefer books over film and television because books allow the imagination to play a more active role in the experience. But the debate can go on beyond this year's contest; here, at least, it is the graphics entries that most impressed the judges. Although there are enough 200-room games among the winners to appease even the most diehard all-text Adventurer, the graphics literally stole the show.

Also of note this year is the number of winners that fall into the "Dungeons & Dragons" variety of games. These games, although not true Adventures in the strictest sense of the term, are still comprised of many of the classic Adventure elements. The lines between these and arcade-type games are becoming less and less distinct. Besides, they're great games and they deserve recognition somewhere, don't they?

I believe I can forego going into just how extraordinarily sophisticated many of the entries were this year. With two of the winners published in this issue of THE RAINBOW, they can speak far better for themselves. And as you're playing the Grand Prize winner, bear in mind that — as excellent as it is — it is not a stand-out program, towering above the rest. It was able, however, to maintain the edge on a fantastic field of finalists. Until the rest of these finalists are published in the second *Rainbow Book of Adventures*, we hope these two current offerings will help to quench that burning thirst that drives man ever in search of Adventure.

With this, we take great pleasure in presenting the following awards to the 18 finalists in the Second Annual Rainbow Adventure Contest:

The Law Enforcement Citation is awarded to Jeff Crow, of Canyon Country, Calif., for his entry, *Chief Inspector*. If you can solve this one very quickly, you should be working for the police. A whodunit in the grandest style, *Chief Inspector* has you reading statements, collecting evidence and filling out accusation forms in an attempt to solve the murder of a wealthy business executive. But you won't find any magic spells in this Adventure; only logic and deductive reasoning can see you through to the solution.

The John Lennon Memorial Award is given to Mark Fetherston, of Kenosha, Wis., for *Yellow Submarine*. An attempt to base an Adventure on this Beatles' classic was an ambitious undertaking that Mark has managed with remarkable success. His story line remains true to the original, his numerous graphics screens appear to have come straight from the original movie and, further, he manages to preserve that feeling that John and the Beatles were able to arouse in many of us during those days. After all, love really *is* all you need.

The Best Packaging Citation is awarded to J.C. Jackson of Owings Mills, Md., for his entry, *Stowaway*. This program was submitted packaged better than a great many of the programs being sold on the market. But the packaging does not tell the whole story; it merely augments a smooth-running program with what is probably the most surprising ending of any entry in this year's contest. Furthermore, it makes extremely good use of several graphics screens, proving that graphics need not be elaborate to be effective.

The Equal Opportunity With CoCo Award goes to Jane Fisher of Raleigh, N.C., for her entry, *The Caves Of Kalakh*. We were pleased that we had so many female contestants this year and we're even more pleased that we are able to list one of them among the winners. What is more, Jane's entry was the only one written entirely in assembly language. Believe me, the speed with which the program reacts to commands was greeted cheerfully by the judges.

The Key To The City Award goes to a local entrant, T. Robert Poppe of Louisville, Ky., for *The Riddle Of Randomar*. Robert says that the Adventure is for beginners since he is a beginner himself, but he is being far too modest. This enjoyable program fared well among some very stiff competition and the graphics screens can hold their own against any competitor.

The G-Man Medal Of Honor is awarded to David Dawson of Omaha, Neb., for his Adventure entry, *Agent*. David uses some interesting line graphics to set the scene for this espionage thriller that requires you to identify your quarry and your contacts by their facial features, obviously something that demands clean and precise graphics.

The Most Unusual Of Show Award goes to Larry Lansberry of Phoenix, Ariz., for *The Wands Of Raga-Dune*. This program is so different that it defies categorization, incorporating elements of all of the other categories. The game takes place in an area of 1,230 rooms, surrounded by a desert limited in size only by the computer's ability to keep adding by one, yet it still maintains logical entry points to each of the screens. This one really has to be played to be understood.

The Bronzed Titanic Life Preserver Award goes to Scott Settembre of Monroe, N.Y., for *Lost Island*. Another great graphics Adventure, this program interweaves the graphics very effectively into action. Scott has created an Adventure in the finest form.

The Space Cadets Merit Badge is awarded to Steve Skrzyniarz of Tacoma, Wash., for his non-graphics Adventure entry, *Lunar Escape*. This program leads you through 137 rooms, mostly on the lunar surface. That means that you have to be very, very careful throughout.

The Neatest Trick Award goes to Robert W. Mangum of Titusville, Fla., for *The Hero Of Lonesome Valley*. Besides being a smooth-running and well-conceived Adventure, this program has an interesting surprise in the listing that was worth a couple of double-takes and an honorable mention.

Dungeons & Dragons Second Runner-Up is Darin Andersen of Smithfield, Utah, for *Dark Castle*. Darin's game uses cursor key control to guide the figure through monster after monster after monster. The only break from the action is when you are able to return to the store for more healing potions, weapons, armor and all the other elements inherent in this type of game.

Dungeons & Dragons First Runner-Up is L. Curtis Boyle, of Saskatoon, Saskatchewan, for his entry, *RingQuest*. Although this program more closely resembles the standard Adventure format than some of the others, it incorporates the hit points, healing potions, etc., that tilt it into the D&D category. The information is presented on the screen in a very nice manner, including graphics of the monsters encountered and the objects in view. In whatever category, this program is a winner.

Non-Graphics First Runner-Up goes to Glen and Bret Dahlgren, of Pittsburgh, Pa., for their entry, *Castle Of The Creator*. With an inverse red display showing all possible information, this program should prove to be enough to keep the most experienced Adventurer busy for days or weeks. And since this game is only the first part of a proposed trilogy, the following chapters may very well turn into a lifetime project.

16K Best Of Show is awarded to Mark Nelson of Orem, Utah, for his entry, *The Head Of The Beast*. This interesting game, which appears in this issue, takes the novel approach of using a joystick to select all commands. It plays smoothly and has a range that is difficult to achieve within the confines of a 16K system. Mark has been able to overcome the limitations and produce a winning Adventure.

(Continued on Page 118)

The TMP FreeForm Filer *No Other Program Can Match It!

OUR CAPABILITIES:

THE SYSTEM: This fully prompted, menu driven program, with *"HELP"* available at any point in the program, gives you real *"EASE OF USE."*

As you enter or edit your text, you can select any word as a *"KEYWORD."* You don't have to type your keywords separately! Each *"CARD"* can contain as many as 117 keywords, and up to nine pages of text similar to a 3" x 5" card, with no field restrictions! Each *"FILE DRAWER"* can contain up to 32,767 pages per drawer!

THE EDIT: *"FULL TEXT EDITING,"* includes an onscreen editing menu, word wrap and the ability to move lines around in a file. Entire cards may be duplicated within a file drawer, making the use of *"STANDARD FORMS"* or *"TEMPLATES"* very easy!

THE SEARCH: You can *"SEARCH"* for the card title, your keyword, or a combination of both. *"WILD CARD SEARCHES"* give you even more powerful search capabilities, such as when you can't remember the spelling of a name!

THE RESULTS: You may list the titles of all cards found in your search, print those cards, or write them to a disk file for later printing or use with a word processor. Printing the cards gives you *"HANDS ON USE"* for maintaining office phone indexes, inventories, and appointment calendars. The FreeForm Filer *FILLS THE GAP* between traditional data base management and word processing programs!

The TMP/FreeForm Filer $124.95

RAINBOW CERTIFICATION SEAL

ORDERING INFORMATION:

Mail to:
TMP Software
2431 E. Douglas
Wichita, Kansas 67211

We accept: MasterCard, Visa, American Express, Money Orders and Checks. To speed up your order call toll free at 1-800-255-1382 Ext. 47.

TMP/Total Management Planning Software

GIVE YOU MORE ABILITIES

TO EASILY STORE AND RETRIEVE IMPORTANT INFORMATION

HOW THE FREEFORM FILER IS USED

SMALL BUSINESS OWNERS: Inventory, service calls, vendor lists, sales orders, prospect notes, project status notes . . . the possibilities are endless!

RESEARCHERS: Put your research notes on the FreeForm Filer and you'll never have to worry about where your notes on the "XYZ Phenomenon" were filed!

ATTORNEYS: You can easily find the names of those cases affected by a new court decision, or cases that need briefs filed next month!

DOCTORS: You can list all of your patients affected by new medications!

IN THE HOME: Again, the possibilities are endless . . . stamp and coin collections, home inventory, payment dates, Christmas card lists, and all your favorite recipes *RIGHT AT YOUR FINGERTIPS!*

OUR PPD* RATING IS THE BEST IN THE INDUSTRY!

*PERFORMANCE PER DOLLAR: There are cheaper filing programs, but none with the power and performance of the FreeForm Filer.

*A REVIEW BY RAINBOW MAGAZINE said no other filing program "can match the abilities and capabilities" of the TMP/FreeForm Filer for "applications that require a lot of text, very variable search criteria, speed and efficiency."

FOOTNOTES: Give the FreeForm to a friend for Christmas, and we'll send it directly to them with a special gift card!

The TMP FreeForm Filer runs on OS-9 systems and requires 64K RAM, one disk drive, and an 80-column screen. (Also available for IBM-compatible computers, and Sanyo MBC 550 and MBC 555, Zenith Z-100, Canon AS-100 and CX-1, Victor 9000, and Tandy 2000.)

ADVENTURE CONTEST WINNER

GRAPHICS
BEST OF SHOW
AND
GRAND PRIZE
WINNER

RESCUE ON ALPHA II

Program by Steven C. Mitchell

With a flick of your wrist, you snap the button on the video and the bureau chief of the Galactic Secret Service's image fades abruptly from the screen. This new assignment from the Service is a troubling one. It seems that every sleazy character in the galaxy is trying to make a grab for power these days, but this latest attempt appears more serious than most. The bureaucrats at the government palace on Centra are certainly in a state of panic over it. But then, those people think they're under attack every time a solar flare extends farther than normal toward their planet.

It seems that some character named Zarkon, one of the last of the group of cosmic

32K ECB

(Steven C. Mitchell is an electronics student attending North Central Technical Institute in Waysau, Wis. He has been programming on the Color Computer for five years and authored one commercial game, Wizard's Tower.*)*

wizards, is masterminding this new threat to the security and peace of the galaxy. And if memory serves, those wizards were a particularly nasty bunch. Their sect was wiped out by a government attack on their home planet during the last consolidation wars, and the few wizards who happened to be off-planet at the time have been vowing revenge ever since.

The story is that several months ago, a scientist doing research in controlled animal mutations, Professor Ion Smartguy, disappeared without a trace from his laboratory on Outpost VI. Not much importance was placed on the matter at the time; after all, it's a big universe, and people disappear all the time for one reason or another. But the intelligence division of GSS has now learned that Professor Smartguy was kidnapped by Zarkon and is being held in a research bunker on a small planetoid known as Alpha II. According to the intelligence reports, Smartguy is being forced to breed an army of mutated, killer beasts — a destructive force more powerful than any before it — which Zarkon intends to unleash upon the galaxy.

In fact, if the reports can be taken seriously, he has already assembled a sizable force of these giant mutants which he uses to augment the legion of robot troops that guard his research bunker. If the reports on the strength of these beasts, called Gormas, are true, it's easy to see why those government vapor-heads back on Centra are so shaken. And the information that they're conducting experiments on the sand snake, indigenous to Alpha II, are especially disquieting. Even without controlled mutation, those creatures are widely regarded as the most deadly ever encountered in the universe. After all, Alpha II is where the term "vicious as a snake" first came into use among the early explorers.

Your mission, as related by the GSS bureau chief, is to gain entrance to Zarkon's stronghold, survive any encounters with the mutants and robot guards, rescue Professor Smartguy and his equipment, defeat the evil wizard, overload the nuclear reactor, and then steal a spacecraft and escape before it explodes. Now, they certainly aren't asking for too much, are they? But after all, they *did* put their best agent on the job. With courage and a lot of luck, you just might be able to pull this one off.

Having finally reached a stable orbit around Alpha II, you glance at the small chunk of rock and ice floating just outside the helm's viewport. It's hard to imagine that this tiny, unimposing speck of debris could harbor any tremendous threat to the galaxy. You learned long ago, though, that judging a situation by appearances is fatal, all too often, in this line of work.

With this pleasant thought swirling through your mind, you energize the transporter and step into the shimmering beam of light, remembering too late that it has been malfunctioning lately, and has acquired the nasty habit of separating you from your weapons and equipment during transport. As the light flares and then dwindles to a glow, the cabin is left in silence.

And the Adventure begins. . . .

Loading and Playing Instructions

Rescue On Alpha II is a graphics Adventure requiring at least 32K of RAM and Extended Color BASIC. If you are entering the program from the listing, it should be saved with *CSAVE“ALPHA II”* before *RUNning*. After that, the program can be loaded with the *CLOAD* command; no other commands are needed prior to loading. If you have a disk drive, the program will not run with the drive controller plugged in.

Upon initialization, you will be asked whether your machine can handle the speed-up *POKE*; if it will, type 'Y' and if not, type 'N'. If the answer is no, the program will run a bit slower, but nothing else is changed. If you answer yes and have trouble with keyboard response, rerun the program and change your answer.

The program uses standard two-word commands: a verb followed by a noun. A multipurpose USE command takes the place of most verbs when using an object. For a list of verbs that the program understands, you can take a peek at Line 140 of the listing. Only one abbreviated command is supported: INV for an "inventory" of items that you are carrying. Directional commands must be entered in full, such as GO SOUTH.

To win the game, you must locate the professor and his equipment: a white case, an instrument box, a chest and a machine known as a Biotron. Then, after pushing the self-destruct button in the nuclear reactor room, you must escape with the professor and his equipment in the awaiting spaceship before the reactor blows.

Sound easy enough? In this program by Steven Mitchell, saving the galaxy from evil is never easy.

— Kevin Nickols

		660	104
88	124	800	22
110	122	855	62
130	58	890	170
150	66	952	134
188	138	1102	16
253	190	1115	180
295	188	1124	222
361	95	1145	255
387	89	1171	48
422	145	1210	116
470	161	1229	243
500	63	1251	71
570	237	END	85

The listing:

```
1 X=RND(TIMER):GOTO50
2 GOSUB1201:GOSUB1205
3 RETURN
4 GOSUB1201:GOSUB1206:GOTO3
5 GOTO170
6 GOSUB5:GOTO570
8 GOTO1275
9 GOTO1245
10 FORX=1TO12:GOTO13
12 FORX=12TO1STEP-1
13 PLAY STR$(X):NEXT:GOTO3
15 FOR X=1TO20:PLAY"L40O3CO4C":N
EXT:GOTO3
20 END
```

```
50 CLEAR950:PMODE4,1:PCLS1:SCREE
N1,1
80 DIM L$(71),LO$(25),O$(25),O(2
5),T(4,71),C(11),C$(11),W$(26),E
(6),E$(6)
82 FORX=1TO71:READL$(X):NEXT
84 FORX=1TO25:READLO$(X),O$(X),O
(X):IF LO$(X)=""THEN LO$(X)="THE
 BUNKER TO THE EAST":O$(X)="BUNK
ER"ELSE IF O(X)<1THEN GOSUB760
85 NEXT
86 T$(1)="NORTH":T$(2)="EAST":T$
(3)="SOUTH":T$(4)="WEST"
88 FORX=1TO71:READT(1,X),T(2,X),
T(3,X),T(4,X):NEXT
90 L=1:WN=6:NU$="NOTHING UNUSUAL
"
92 FORX=1TO11:READC$(X),C(X):NEX
T
94 FORX=1TO26:READW$(X):W$(X)=W$
(X)+"BR4":NEXT
95 N$="       RESCUE ON ALPHA II
":GOSUB5:N$="     BY STEVEN C. M
ITCHELL":GOSUB5:N$=" ":GOSUB5:N$
="DO YOU WANT THE SPEED UP POKE?
":GOSUB5
96 X$=INKEY$:IF X$="Y"THEN POKE6
5495,0ELSE IFX$="N"THEN POKE6549
4,0ELSE96
99 FORX=1TO6:READE$(X),E(X):NEXT
:GOTO200
100 DATATHE DESERT,S,THE LIVING
QUARTERS,A LEAD LINED ROOM,THE C
ELL BLOCK,,AN OUTDOOR WALKWAY,,,
A SMALL ROOM,,,AN OUTDOOR WALKWA
Y,THE ENTRY HALL,,
102 DATAA SMALL SQUARE ROOM,EVIL
 ZARKON'S QUARTERS,THE LANDING B
AY,,A MEETING ROOM,THE WEST GYM,
THE EAST GYM,EVIL ZARKONS BEDROO
M,THE ESCAPE SHIP,,,,,S
104 DATATHE NORTH LAB,,THE CHEMI
STRY LAB,THE BREEDING PIT,C,C,TH
E LAIR OF THE GORMA,THE SOUTH LA
B,B,B,B,C,C,C,
106 DATAB,B,B,C,C,C,,,,C,C,C,,TH
E REACTOR ROOM,,C,C,C,C,,,S,C,C,
C,THE LAIR OF THE GIANT SAND SNA
KE
110 DATA,,1,,,7,,,13,A SIGN ON T
HE WALL,SIGN,10,ATHLETIC EQUIPME
NT,EQUIPMENT,22,A SLOT ON THE NO
RTH WALL,SLOT,11,BUTTON ON THE W
EST WALL,BUTTON,17
112 DATATHE SELF DESTRUCT BUTTON
,BUTTON,59,THE KEY HOLE,HOLE,25,
```

CY-BURNET-ICS

Specialist in educational software for your CoCo. Developed by educators to be teacher and student friendly. Special features include AUTO RUN, MENU DRIVEN, TALKING AND NON TALKING VERSIONS, and REWARDS. All programs are 16K Extended BASIC unless otherwise noted.

ADDITION
Preschool - 5th
8 Levels
(C) $29.95 (D) $32.95

MULTIPLICATION
2nd grade - H.S.
6 Levels
(C) $15.95 (D) $18.95

BEAT-THE-COMPUTER MULTIPLICATION
3rd grade - ADULT
Timed game vs. computer while practicing multiplication.
(C) $15.95 (D) $18.95

BEFORE/BETWEEN/AFTER NUMBER DRILL
Preschool - 5th
(RAINBOW Review May '84)
(C) $29.95 (D) $32.95

NUMBER READINESS
Preschool - 1st
Matching numbers with graphic display.
32K Extended Basic.
(C) $24.95 (D) $27.95

ALPHABET*
Preschool - 1st
(RAINBOW Review Dec. '83)
6 Levels
(C) $29.95 (D) $32.95*

CLOCK ARITHMETIC*
7 Levels
Kindergarten - 3rd
(RAINBOW Review Feb. '84)
32K Extended Basic.
(C) $29.95 (D) $32.95

SUBTRACTION
Kindergarten - 5th
13 Levels
32K Extended Basic
(C) $29.95 (D) $32.95

WIZARD!
Readable, elegant new character set for your Telewriter-64* word processor. Crisp, calligraphic-style characters with **true lower-case descenders** install quickly in any CoCo system.
(C) $16.95

*Telewriter-64 is a trademark of Cognitec

PRIMARY NUMBER SKILLS
Preschool - 2nd
11 Levels
32K Extended Basic
(C) $29.95 (D) $32.95

NUMBER/COLOR WORD*
Preschool - 2nd
8 Levels
32K Extended Basic
(C) $29.95 (D) $32.95

COLOR MAILBAG
Creates mailing list and address labels.
(C) $29.95 (D) $32.95

SINGLE DRIVE DISK BACKUP
Copy a complete disk in 3 passes or fewer.
64K Disk Basic (D) $32.95

"THE VOICE"
Make our programs talk by purchasing "THE VOICE" hardware speech synthesizer. Just plug into your ROM port and you're ready.
"THE VOICE" $79.95 (cass. or disk)

Connect your Disk Drives and "THE VOICE" with Y CABLE.
Y CABLE $29.95

***Please add $5.00 for talking version of program. Both voice and non-voice versions provided with each talking program you order.**

Send self-addressed, stamped envelope for free catalog.
Board of Education requisitions honored.
Dealer inquiries invited.
Add $1.50 per program shipping and handling;
Tennessee residents add 7% sales tax.
Mail check or money order to:

CY-BURNET-ICS
5705 Chesswood Drive, Knoxville, TN 37912
Phone 615-688-4865

```
A POOL OF WATER,POOL,56
114 DATAA CAPE,CAPE,,A KEY,KEY,,
A CHAIN ,CHAIN,,A SILVER DISK,DI
SK,,A LASER GUN,GUN,-1,A PACK OF
 POISON PELLETS,PELLETS,-1,THE I
NSTRUMENT BOX,BOX,,THE WHITE CAS
E,CASE,37,THE CHEST,CHEST,,THE B
IOTRON,BIOTRON,,A RING,RING,24
116 DATAA PAIR OF GLOVES,GLOVES,
-1,A LEAD JAR,JAR,2,RADIOACTIVE
MATTER,MATTER,4,THE PROFESSOR,PR
OFESSOR,5
120 DATA,,7,,,,-1,,,,9,,,,-1,,,,
11,,,,,
121 DATA1,,13,,-1,9,14,,3,,,8,-1
,11,16,,-2,12,,10,,,18,11
122 DATA7,-1,19,,8,15,20,-1,,16,
,14,10,17,-1,15,,,,16,12,,24,
124 DATA13,,25,,14,,26,,,,-1,,-1
,23,,,,,-1,22,18,,,
126 DATA19,,,,20,27,,,-1,28,,26,
,29,,27,-1,30,,28,,,,29
128 DATA,32,38,,,33,,31,,34,40,3
2,,-1,,33,69,36,42,-1,70,,43,35,
,,44,
130 DATA31,,-1,,46,40,46,41,33,4
1,47,39,48,39,48,40,35,43,49,44,
36,44,50,42,37,42,51,43
132 DATA-1,,52,,39,47,39,48,40,4
8,54,46,41,46,41,47,42,50,55,51,
43,51,56,49,44,49,57,50
134 DATA45,53,58,,,54,,52,47,17,
60,53,49,56,62,57,50,57,63,55,51
,55,64,56
136 DATA52,,65,,,,-1,,54,-1,,,68
,62,68,-1,55,63,69,61,56,64,70,6
2,57,68,71,63
138 DATA58,66,,,-1,67,,65,,,,66,
61,69,61,64,62,70,35,68,63,71,36
,69,64,,,70
140 DATAGO,1,USE,2,PUSH,3,GET,4,
TAKE,4,DROP,5,INVENTORY,6,OPEN,7
,LOOK,8,LEAVE,5,INV,6
144 DATAU4E2F2D2NL4D2,NR3U6R3FDG
NL3FDGBR,BUFNR3HU4ER3BD6,NR3U6R3
FD4GBR
145 DATANR4U3NR3U3R4BD6,U3NR3U3R
4BD6,BUFR2EU2L2BL2D3U5ER2FBD5,U6
D3R4U3D6
146 DATAR4L2U6L2R4BD6,BUFR2EU5BD
6,U6D3RNE3F3,NU6R4
147 DATAU6F2E2D6,U6DF4DNU6,BUU4E
R2FD4GL2HFBR3,U6R3FDGL2BD3BR3
148 DATABUU4ER2FD4GL2HFR2EHF2L,U
6R3FDGL3R2F2D,BUFR2EUHL2HEUR2FBD
5,BU6R4L2D6BR2
149 DATABU6D5FR2EU5D6,BU6D2FD2FE
U2EU2BD6,NU6E2F2NU6
150 DATAUE4UBL4DF4D,BU5UDF2E2UDG
2D3BR2,BU6R4DG4D1R4
152 DATAA ROBOT GUARD,8,A ROBOT
GUARD,26,A KILLER-ROBOT,11,EVIL
ZARKON,31,THE GIANT SAND SNAKE,7
1,THE GORMA,37
170 PMODE4:IFV>10THEN GOSUB415
172 COLOR4:X$=STR$(100+(V*8)):DR
AW"BM0,"+X$
174 IFLEN(N$)<34THEN180
175 FORZ=34TO1STEP-1:X$=MID$(N$,
Z,1):IF X$=" "THEN177
176 NEXT:Z=34
```

TEAC
SANYO
MPI

SLIM LINE
DISK
DRIVES

HALF HEIGHT

DIRECT DRIVE, ½ HT. 40 track, 5ms t/t, DSDD

TEAC Single drive, double sided + case & supply	**$259.**
TEAC Dual drives, double sided + case & supply	**$459.**
SANYO Single drive, double sided + case & supply	**$249.**
SANYO Dual drives, double sided + case & supply	**$439.**

FULL HEIGHT, 40 track, 5 ms t/t, DSDD.

MPI Single drive, double sided + case & supply	**$199.**
MPI Dual drives, double sided + case & supply	**$359.**

All drives include case and power supply in choice of grey or off white. Dual drives come assembled in dual case with dual supply and rear gold plated data connector. To make drives into complete system add J&M disk controller with your choice of DOS plus drive cable.

J&M controller with JDOS and manual	**$129.**
J&M controller with RSDOS subject to avail.	**$129.**
J&M controller without DOS ROM chip	**$109.**
JDOS ROM with manual	**$ 30.**

Single drive cable with gold contacts 3'	**$ 14.**
Dual drive cable with gold contacts 3'	**$ 19.**

How to order

All items have a 90 day or better replacement policy by us. Include a complete product description of items desired. Add $3. per order for S&H. Add $1.75 for COD. For MasterCard or Visa orders add 3% of total including shipping. Indiana residents add 5% sales tax.

OZONE ENGINEERING
4769 South 200 East
Kokomo, IN 46902
Ph. 317-453-0989
5 - 10 p.m.

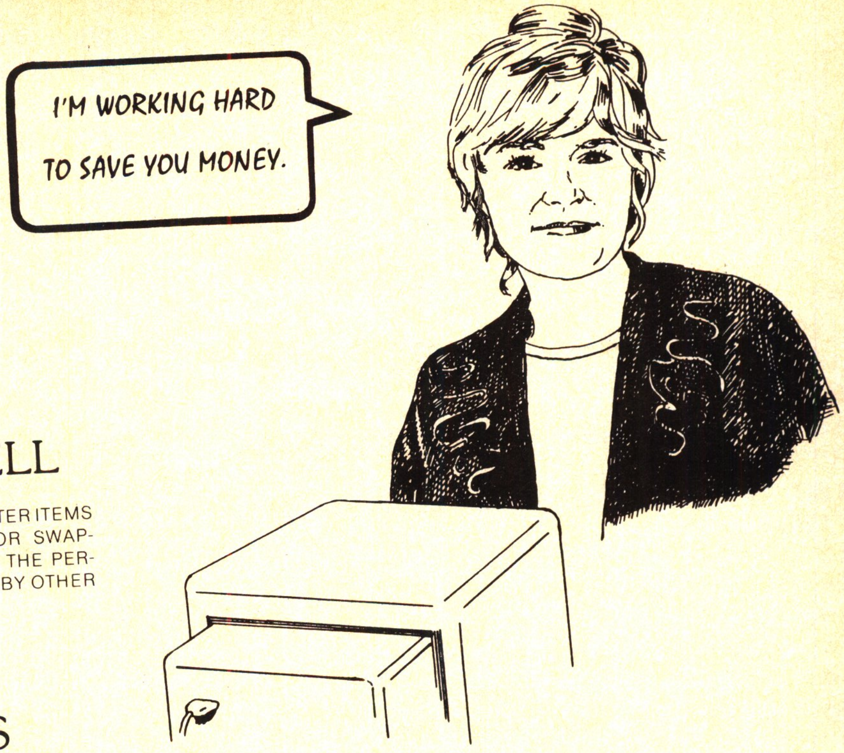
$ LOTTO PLAYERS LOTTO $
LET YOUR TRS-80 COLOR COMPUTER
SELECT YOUR NUMBERS-TAPE ONLY
SEND $5.95 CHECK OR M.O. TO
RAM 1088 POPLAR TREE DRIVE
ANNAPOLIS MARYLAND,21401
FREE WITH EACH ORDER FREE
PICK 3 & PICK 4

RAINBOW CERTIFICATION SEAL

Free Offer

HOW TO EARN EXTRA MONEY
WITH YOUR HOME COMPUTER.

See Details Below.


I'M WORKING HARD TO SAVE YOU MONEY.

BUY, SWAP AND SELL

MOM'S CLASSIFIED BULLETIN BOARD OF COMPUTER ITEMS IS YOUR OPPORTUNITY TO LIST FOR SALE OR SWAP-ITEMS THAT YOU NO LONGER NEED. ALSO, IT'S THE PERFECT PLACE TO SHOP FOR BARGAINS OFFERED BY OTHER MEMBERS OF MOM'S FAMILY.

NEW PRODUCTS

MOM CAN SAVE YOU MONEY ON NEW HARDWARE, SOFTWARE PRINTERS, MODEMS, MONITORS, DISC DRIVES AND MUCH MORE - MANY OF THE SAME ITEMS ADVERTISED HERE IN RAINBOW MAGAZINE.

DISCOUNTS

SAVE 5% TO 35% ON ALL NEW ITEMS YOU BUY THROUGH MOM - BEFORE YOU BUY, CHECK WITH MOM FOR LOWEST PRICES.

SPECIAL OFFER

FREE WITH MEMBERSHIP - YOUR PERSONAL COPY OF "18 WAYS TO EARN EXTRA MONEY WITH YOUR HOME COMPUTER" JOIN TODAY AND YOU CAN START EARNING EXTRA MONEY USING MOM'S GUIDE.

MOM PROMISES

PERSONALIZED SERVICE - TO MOM YOUR NOT JUST ANOTHER NAME . . . YOUR PART OF HER FAMILY. SHE'S INTERESTED IN YOU AND HOW YOU USE YOUR COMPUTER. WRITE TO HER ABOUT PROGRAMMING, EQUIPMENT, SOFTWARE, PROGRAMMING AND YOUR OWN IDEAS. HAVE COMPUTER PROBLEMS? WRITE MOM - SHE CARES !!

Software Programmers

Mom can help you Market YOUR programs.

Others have benefited - why not You ?

BECOME A MEMBER OF MOM'S FAMILY

Yes, I want to become a member of MOM'S COMPUTER CLUB FAMILY and enclose my personal check for $14.95 for which Mom will rush my MEMBERSHIP CARD and my CERTIFICATE along with complete details and benefits of membership. Also included will be my FREE issue of "18 WAYS TO EARN EXTRA MONEY WITH YOUR HOME COMPUTER." I understand that my membership will be entered promptly and that there will be no delay due to payment with personal check, or money order.

Date ______

Name ______ Apt # ______

Address ______

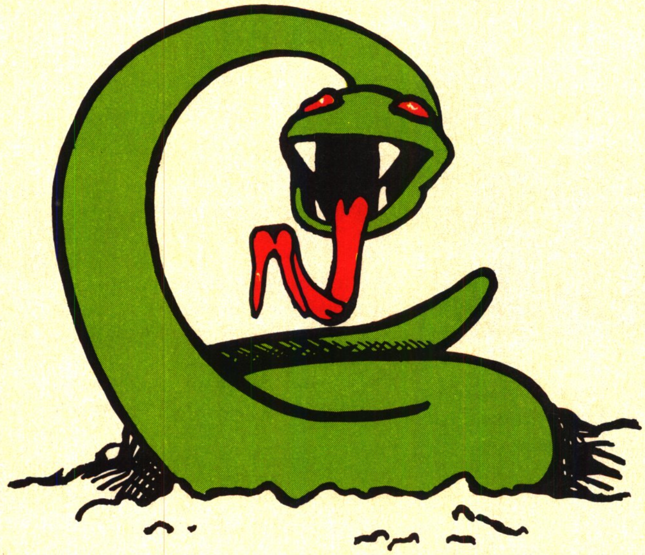
City/State/Zip ______

Phone ( ) ______ My computer is a ______

Make checks payable to:
COMPUTER MOM
4111 Lincoln Blvd. #319
Marina del Rey, CA 90292

```
177 NA$=MID$(N$,Z+1):N$=LEFT$(N$
,Z)
180 FORZ=1TO LEN(N$):N1$=MID$(N$
,Z,1):N1=ASC(N1$)
182 IFN1>64AND N1<91THEN N1=N1-6
4:DRAW W$(N1):GOTO190
183 IFN1=63THEN DRAW"BU5ER2FDGLD
BDDBR6"
184 IFN1=58THEN DRAW"BUUBU2UBD5B
R3"
185 IFN1=46THEN DRAW"RBR3"
186 IFN1=44THEN DRAW"R2DGEUBR4":
GOTO190
187 IFN1=33THEN DRAW"UBU2U3BD6BR
3"
188 IFN1=45THEN DRAW"BU3R3BD3BR3
":GOTO190
189 IFN1=39THEN DRAW"BU5URG2BD4B
R4"ELSE DRAW"BR7"
190 NEXT
192 V=V+1:IFNA$=""THEN3
194 N$=NA$:NA$="":GOTO5
200 GOSUB500:GOSUB290:N$="YOU AR
E IN "+L$(L):GOSUB1000:V=1:GOSUB
5
210 VB=0:N$="YOU SEE: ":GOSUB770
224 IF VB=0THEN N$=N$+NU$
226 VB=0:GOSUB5:IF WN<3THEN N$="
YOU ARE GRAVELY WOUNDED!":GOSUB5
:GOTO230
227 IF WN<6THEN N$="YOU ARE WOUN
DED!":GOSUB5
230 N$="OBVIOUS EXITS:"
240 FOR X=1TO4:IF T(X,L)>0THEN N
$=N$+T$(X)+", "
241 NEXTX:GOSUB5:FORX=1TO4
242 IF T(X,L)=-1 THEN N$="A CLOS
ED DOOR IS TO THE "+T$(X)+".":GO
SUB5
244 IF T(X,L)=-2 THEN N$="A LASE
R BARRED DOORWAY IS TO THE "+T$(
X)+".":GOSUB5
245 NEXT:GOSUB780
248 GOSUB700:N$="WHAT NOW?":GOSU
B5:GOSUB249:GOTO260
249 A$="":TIMER=0:BB=0
250 I$=INKEY$:GOTO256
251 SOUND1,1:IF I$=CHR$(13)THEN3
252 N1=ASC(I$):IF N1=8 AND LEN(A
$)>0 THEN A$=LEFT$(A$,LEN(A$)-1)
:IF II$=" "THEN DRAW"BM-7,0":GOT
O250ELSE DRAW"C1L8UR7UL7UR7UL7UR
7UL7D6":COLOR0:GOTO250
253 IF N1=32THEN DRAW"BR8":A$=A$
+" ":GOTO250
254 IF N1>64AND N1<91THEN A$=A$+
I$:II$=I$:N1=N1-64:DRAW W$(N1)
255 IF LEN(A$)>24THEN3ELSE250
256 IF TIMER>599THEN TIMER=0:GOS
UB500:FOR Z=1TO6:IF BB=1AND E(Z)
=L THEN FOR X=1TO2:GOTO245ELSE I
F BB=0AND E(Z)=L THEN570ELSE NEX
T
257 IF I$=""THEN250ELSE251
260 FOR X=1TO LEN(A$):IF MID$(A$
,X,1)=" "THEN A1$=LEFT$(A$,X-1):
B$=MID$(A$,X+1,LEN(A$)-X+1):GOTO
270 ELSE NEXT
265 A1$=A$
270 FOR X=1TO11
272 IF C$(X)=A1$ THEN A=C(X):GOT
O300
274 NEXT
280 N$="I DON'T KNOW WHAT "+A1$+
" MEANS.":GOTO426
290 IF L$(L)=""THEN L$(L)="A HAL
LWAY"
292 IF L$(L)="C"THEN L$(L)="THE
CAVERNS"
294 IF L$(L)="B"THEN L$(L)="THE
BOTANICAL GARDENS"
295 IF L$(L)="S"THEN L$(L)="A ST
ORAGE ROOM"
296 GOTO3
300 ON A GOTO 320,340,360,375,40
0,420,440,480
315 IF VA>0THEN T(VA,VC)=-1:VA=0
316 GOTO3
320 FOR X=1TO4:IFB$=T$(X)THEN DR
=X:GOTO325
322 NEXT:N$="I DON'T KNOW WHERE
"+B$+" IS.":GOTO426
325 X=T(DR,L):IFX>0THEN GOSUB580
:L=T(DR,L):GOSUB315:GOTO200
327 IFX=-2THEN N$="THE LASERS CU
T YOU TO PIECES.":GOSUB5:GOTO300
0
328 IFX=-1THEN N$="THE DOOR BLOC
KS YOUR WAY":GOTO6
329 N$="YOU CAN'T GO THAT WAY!":
GOTO426
340 FOR X=11TO25:IF B$=O$(X)AND
O(X)=1000THEN342
341 NEXT:N$="YOU DONT HAVE A "+B
$:GOTO426
342 IF X=12 AND L=25 THEN2000
343 IF X=24 AND E(6)=L THEN550
344 IF X=14 AND L=11 THEN T(1,11
)=5:N$="THE LASER BARS ARE GONE.
":LO$(14)="A SHINY DISK IN THE S
LOT":O(14)=11:DRAW"C0":GOSUB1157
:GOTO6
345 IF X=15THEN520
346 IF X=16 THEN560
348 IF X=22 THEN VE=1:N$="THE GL
OVES ARE ON.":GOTO6
```

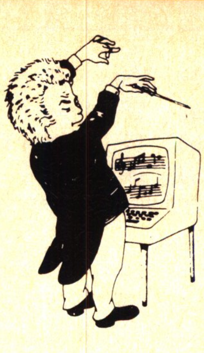
```
354 N$="NO EFFECT":GOTO6
360 IF B$<>"BUTTON"THEN354
361 IF L=17THEN365
362 IF L=59 THEN N$="THE SELF-DE
STRUCT TIMER IS ON!!":F=1:FF=0:G
OTO6
364 N$="I SEE NO "+B$:GOTO6
365 IF T(4,17)=16THEN N$="THE RO
OM DROPS LIKE AN ELEVATOR.":X=54
:GOTO367
366 N$="THE ROOM RISES.":X=16
367 T(4,17)=X:GOTO6
```



```
375 IF B$="PROFESSOR"THEN380ELSE
 Z=0:FOR X=1TO24:IF O(X)=1000THE
N Z=Z+1
376 IF Z>5THEN N$="YOU CAN'T TAK
E THAT. YOU'RE CARRYING TOO MUCH
!":GOTO426
378 NEXT
380 FOR X=1TO25:IF B$=O$(X)AND O
(X)=L THEN 390
382 NEXT
384 N$="I DON'T SEE A "+B$+"!":G
OTO426
385 IF VE=0THEN N$="THE RADIOACT
IVITY ATE INTO YOUR HANDS,ENTERE
D YOUR SYSTEM, AND  KILLED YOU!"
:GOSUB5:GOTO3000
386 N$="THE MATTER IS JELLY-LIKE
. WHAT WILL YOU PUT IT IN?":GOSU
B5:GOSUB249:IF O(23)<>1000THEN38
8ELSE IF A$="JAR"OR A$="THE JAR"
THEN N$="YOU GOT IT!":LO$(24)=LO
$(24)+" IN LEAD JAR":GOTO396
387 FOR X=11TO25:IF A$=O$(X)AND
O(X)=1000THEN N$="THAT WON'T HOL
D IT!":GOTO6
388 N$="YOU DON'T HAVE THAT!":GO
TO6
390 IF X<11 THEN N$="YOU CAN'T T
AKE THAT!":GOTO6
391 IF X=24THEN385
392 IF X<25 THEN N$=LO$(X)+" HAS
 BEEN TAKEN"
393 IF X=14AND RIGHT$(LO$(14),1)
="T" THEN GOSUB170:LO$(14)="A SH
INY DISK":T(1,11)=-2:N$="THE LAS
ER BARS RETURN!":GOSUB1156
394 IF X=25 THEN N$="THE PROFESS
OR COMES WITH YOU!"
395 IF X=23AND RIGHT$(LO$(24),3)
="JAR"THEN O(24)=1000
396 O(X)=1000:GOTO410
400 FOR X=11TO25:IF B$=O$(X)AND
O(X)=1000THEN O(X)=L:N$="OK":GOT
O405
402 NEXT:N$="YOU DON'T HAVE THAT
.":GOTO6
405 IF X=22THEN VE=0
406 IF X=23AND O(24)=1000THEN O(
24)=L
407 IF X=24THEN LO$(24)="RADIOAC
TIVE MATTER"
410 GOSUB5:GOSUB750:GOTO570
415 COLOR1:LINE(0,102)-(255,191)
,PSET,BF:V=1:GOTO3
420 GOSUB415:N$="YOU ARE CARRYIN
G:"
422 FOR X=11TO24:IF O(X)=1000THE
N N$=N$+LO$(X)+", "
424 NEXT:IF O(25)=1000THEN GOSUB
170:N$="THE PROFESSOR IS WITH YO
U."
426 GOSUB5:GOTO248
440 FOR X=1TO4:IF T(X,L)=-1AND B
$="DOOR"AND L<>61THEN GOSUB450:N
$="THE DOOR IS OPEN TO THE "+T$(
X):T(VA,VC)=VD:GOTO6
441 IF L=61 THEN N$="IT'S LOCKED
 FROM THIS SIDE.":GOTO6
442 NEXT:IF B$="DOOR"THEN N$="I
SEE NO DOOR!":GOTO6
448 N$="OK":GOTO6
450 VC=L:IFL=13THEN VA=2:VD=14
451 IFL=14THEN VA=4:VD=13
452 IFL=27THEN VA=1:VD=21
453 IFL=21THEN VA=3:VD=27
454 IFL=8THEN VA=1:VD=2
455 IFL=2THEN VA=3:VD=8
456 IFL=4THEN VA=3:VD=10
457 IFL=10THEN VA=1:VD=4
458 IFL=38THEN VA=3:VD=45
459 IFL=45THEN VA=1:VD=38
```

NEW!

MUSICA 2



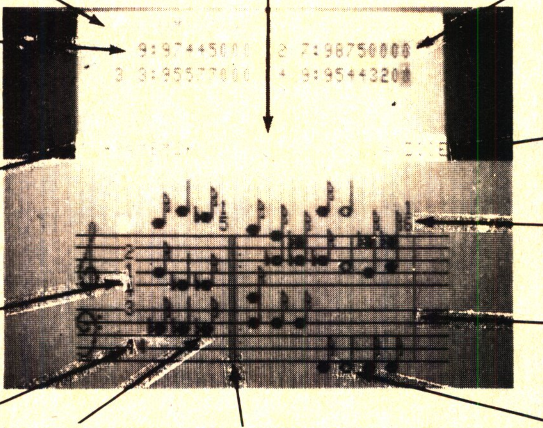
~~Tape $34.95~~
~~Disk $39.95~~

Nov. & Dec.
ONLY . . . **$29.95**
Tape or Disk

High resolution graphic display, looks just like sheet music.

When in stereo mode, music is played through our STEREO PAK (purchased separately).

Voice timer (waveshape) may be altered by specifying harmonic content just like stops on an organ. Billions of combinations available.



Loudness of each voice may be individually specified.

During editing, voice being inserted is displayed.

Memory available is constantly displayed.

Each measure is numbered for easy reading of music.

Voice waveshapes may be exchanged between voices at any point.

Measure bars aid in reading and developing music.

Tempo may be specified and may even be altered as the music plays.

Flats and sharps supported.

Repeat bars allow repeating of music without re-inserting music a second or third time.

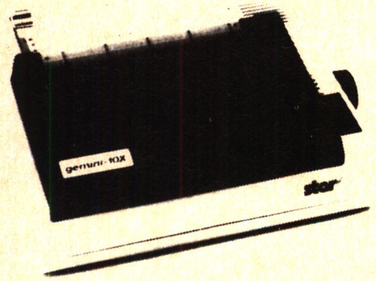
Each voice may be visually highlighted for easy identification.

GREAT MUSIC TEACHER

"Musica 2 is GREAT!"
Stephen Wilson

"It's the best four part harmony composer on the market and the most used program in may files."
R.G. Wrights

"Of all the music programs, and I've had them all, there is no comparison in flexibility, simplicity of operation and in the warm vibrant tones that it produces. I went out and spent $700.00 on stereo equipment just so I could more thoroughly enjoy Musica 2 and the Stereo Pak!"
Howard Lentz
TCI Industries



Output your music to any dot matrix printer (Gemini 10X, Epson, R.S. printers, Okidata, etc.)

Download music from our BBS or Compuserve

THERE'S MORE

- 4 Voices produced simultaneously
- Input notes from keyboard or joystick
- Play music from your own BASIC program
- Block copy music for easy music development
- 100% machine language so it is lightning fast
- Vibrato effect easily produced
- With STEREO PAK, voices may be switched between left and right speakers as music plays
- MUSICA 2 is 100% software, no need for hardware unless you want music produced in STEREO. In that case, the STEREO PAK may be purchased separately. It's a must for the audiophile!
- Durations include: whole, half, quarter, eighth, sixteenth, thirty second, sixty-fourth, and triplet.
- 30 page manual describes all.

'I THOUGHT ONLY AN APPLE SOUNDED THAT GOOD'

That's what I was told after I gave a seminar and demonstration of MUSICA 2 and the STEREO PAK at the Chicago Rainbowfest. I smiled and thanked the young man for the "supposed" compliment, but upon reflection, I became angered by the apparent belief that the CoCo is inferior in this regard. Nothing could be further from the truth.

To help fight this false belief, we've decided to lower the price of MUSICA 2 until the end of the year to help spread the word.

We will also keep the STEREO PAK price at $39.95 and give you a complete refund if you are not 100% satisfied with the STEREO PAK.

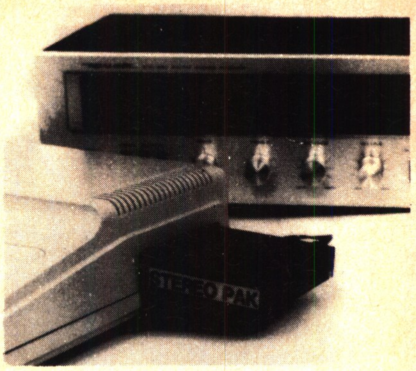
NEW!

STEREO PAK™

Plug this gem into your computer, connect to your home stereo system and sit back and enjoy music realism. The STEREO PAK is a hardware music synthesizer that plays our MUSIC LIBRARY and MUSICA 2 music in stereo. Because it was designed specifically with music reproduction in mind, the sound is superb. The highs are crisp and clear while the bass notes will rattle your walls.

The STEREO PAK is all hardware. It is intended as an enhancement for MUSICA 2 and our MUSIC LIBRARY. Disk owners may use the STEREO PAK with the R.S. Multi-Pak or our Y-CABLE ($28.95)

~~$49.95~~
39^{95}
INTRODUCTORY
PRICE



NEW!

MUSIC LIBRARY™ 3 VOLUMES

You get over 100 four voice songs with a combined playing time of 3 hours. That's right, 3 hours of music. You won't belive your CoCo could sound so good. To fit over 100 songs required both sides of 5 C-20 tapes and the disk version uses 5 full disks (that's a half box of disks).

A JUKE BOX selection program is included to allow you to select specific songs or automatically play each. These songs are ready to go, you don't need MUSICA 2 or a knowledge of music.

These songs were developed using the best music program available for the CoCo; MUSICA 2. The tunes may be used as source files for MUSICA 2 and changed by the user. When coupled with the STEREO PAK the songs are reproduced in stereo with unsurpassed realism.

Nov. & Dec
Only
Buy
M.L. 100
& M.L. 200
Get
M.L. 300
FREE !

MUSIC LIBRARY 100 categories:

Stage, Screen, and TV	Classical
Music of the 70's	Christmas (popular)
Music of the 60's	Christmas (traditional)
Music of the 50's	Patriotic
Old Time Favorites	Polka Party

MUSIC LIBRARY 200
Our second volume of 100 tunes, 3½ hours of music.

MUSIC LIBRARY 300
Our third volume of 100 tunes, 3 more hours of music.

MUSIC LIBRARY (Each Volume) . .	(32K Tape) . . .	**$34.95**
(Specify 100, 200, or 300)	(32K Disk)	**$39.95**

FREE SOFTWARE

NEW!

SPEECH SYSTEMS DATAPEN

only . . . **$29.95**

HIGHEST QUALITY

Two programs are provided free with each DATAPEN. SKETCH is a superb high resolution color drawing program allowing precise drawing and freehand sketching, painting and much more. SHAPE CREATE is a high resolution library shape drawing program. You can even save your work to tape or disk for later display or editing.

The software is shipped on tape and may easily be moved to disk. Included is complete documentation to allow you to integrate the DATAPEN into your own BASIC program.

EASY TO USE!

The DATAPEN is a lightpen, but unlike other light pens, it is far more sophisitcated.

- Insensitive to ambient light.
- Responds to different colors
- Program accessible LED lamp readout
- Switch for program control

WE STAND BEHIND OUR PRODUCTS

Like all our other products, if it is not the best, we won't sell it. If you're not 100% satisfied, merely return the DATAPEN for a complete refund.

FREE
BLANK DISK
OR TAPE
WITH EVERY
ORDER

VISA® MasterCard

Dealer Inquiries
Invited

We accept CASH, CHECK, COD, VISA and MASTER CARD orders.

Shipping and handling US and Canada	$3.00
Shipping and handling outside the US and Canada	$5.00
COD charge	$2.00

Illinois residents add 6¼% sales tax

Speech Systems

38W 255 DEERPATH ROAD
BATAVIA, ILLINOIS 60510
(312) 879-6880 (VOICE)
(312) 879-6811 (24 HR. BBS)
CALL ANY DAY, ANYTIME TO ORDER. ALSO ORDER BY MAIL OR BBS.

'THE VOICE'

LAST CHANCE
AT **$79.95**

THE ROLLS ROYCE OF SPEECH SYNTHESIZERS

RICH PARRY
Voice Project Manager

In designing the first speech synthesizer for the Color Computer, our design goal was not to see how cheap we could make it, but how good. Perhaps we made it too good, since the original price was well over $150.00. We managed to reduce the price to $79.95 without effecting the quality. Unfortunately, we can't keep it at this low price forever, but we will until the end of the year. And to entice you a little, we are going to give you a FREE TALKING HEAD program and any other piece of software in our TALKING SOFTWARE LIBRARY *FREE.* Even TERMTALK which sells for $49.95.

If you think we're bragging, listen to our customers.

FREE TALKING HEAD

Up to $49.95 off
Pick any program from our library.

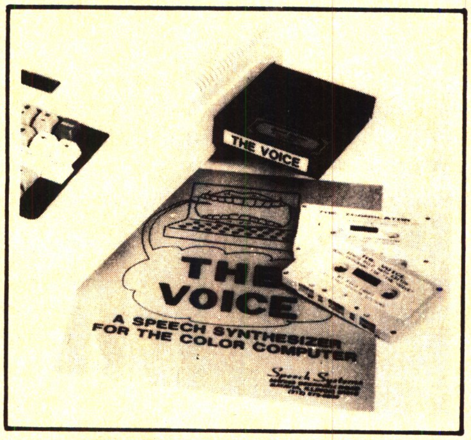
"Let me express my thoughts about the VOICE. SUPER! GREAT! OUTSTANDING!
Ben Burnett

"I found the VOICE is the best speech synthesizer on the market for amateurs or experts, in other words it's fantastic."
Deni Furnell

"The VOICE is really great."
Tim Rueb

"Congratulations on a really great superior product."
Leonard Hyre

- Only the VOICE will work in both the CoCo 1 and CoCo2 without modification.
- Only the VOICE amplifies and filters the speech to give you increased intelligibility.
- Only the VOICE gives you a volume and pitch control for added flexibility and sound effects.
- Only the VOICE has dual outputs. Listen through your TV speaker or connect to your stereo system.
- Only the VOICE is enclosed in a metal case with a black satin finish to eliminate TV interference.



FREE TRANSLATOR

A special ML "translation program" is included free which automatically converts English to speech. This program is incredible. It not only speaks anything you request, but even numbers such as $12,234.55 are spoken in dollars and cents. In addition, an "exception table" option actually allows you to specify a particular pronunciation if you like.

Writing your own BASIC programs to use speech is a "piece of cake". Just change your PRINT statements to USR.

A very special feature allows all text that is sent to the screen to be spoken. Thus a blind person can actually write programs. You'll be amazed!

STILL UNDECIDED?

If you're not 100% satisfied after 15 days, simply return the VOICE for a complete refund.

WORLD'S LARGEST TALKING SOFTWARE LIBRARY

PICK ONE FREE WITH YOUR VOICE ORDER

PRE-SCHOOL

NEW **TALKING ALPHABET** A program designed to help the pre-schooler master the alphabet. $29.95

NEW **TALKING NUMBERS & COLORS** A must program for the very young. High Resolution graphics to insure attention and concentration $29.95

NEW **TALKING NUMBER SKILLS** The child becomes familiar with the shape and meaning of numbers. $29.95

NEW **TALKING CLOCK** In these days of the digital clock, children miss an important education. This program aids the student in mastering the traditional analog clock. High Resoultion graphics. $29.95

GRADES 2-6

SPELLING TESTER A graphic spelling game. The student is shown objects to be spelled. $9.95

POETRY CREATOR The VOICE speech unit is used to speak poetry that is created. $9.95

SHORT STORY MAKER A program to create and speak stories created by the child. $9.95

FOREIGN LANGUAGE Learn a foreign language. French dictionary is included. $9.95

NEW **TALKING SUBTRACTION** A program specifically designed to help the student learn subtraction. $29.95

(GRADES 2-6 continued)

NEW **KING AUTHOR'S TALES** A creative writing tool to allow a child to write compositions, or short stories. Q & A option is also included. $29.95

COLOR MATH Addition, Subtraction, Multiplication, and Division are mastered. Student may specify difficulty level. $24.95

SPELL-A-TRON Student builds a dictionary of words to be quizzed on. Perfect for Spelling B. $24.95

NEW **ANIMATED SENTENCES** The child builds complete sentences from a graphic menu. The action is then spoken and acted out graphically. $24.95

PRESIDENTS The student is able to master the Presidents of the US. $9.95

STATES A program designed to aid the student in learning correct spelling of the states. $9.95

CAPITALS Learning the State's Capitals is made more interesting using speech. $9.95

HANGMAN A word guessing game. You must guess the word before you hang. $9.95

MATH DRILL A program to help teach arithmetic. $9.95

All software, except Termtalk, shipped on tape but may be moved to disk.

ENTERTAINMENT

FINAL COUNTDOWN A talking adventure in which you must stop the mad general from starting WW III. $24.95

NEW **CAVE BEAR** A talking adventure much like the orginal adventure game in which you travel through caves hunting for treasure. $29.95

NEW **TAKING BINGO** The VOICE speech unit calls the tiles while everyone gets a chance to play. Chips and cards are included. $24.95

SCORE E-Z A yahtzee type game. Up to six can play. $24.95

STAR TALK You're the Star Fleet Captain, your mission, "destroy the Dragon Ships". All status reports are spoken. $24.95

NEW **SHIP HUNT** Play Battleship against your computer. $24.95

ESTHER A ML program fashioned after ELIZA the talking psychoanalyst. An excellent example of artificial intelligence.. $24.95

TERMTALK A talking terminal program.
Features include:
Upload and download programs.
Full or Split Screen.
Normal or Revers Video
Control Xmit Protocols
Buffer Editing.
All this plus it speaks. TAPE $39.95 DISK $49.95

NEW!

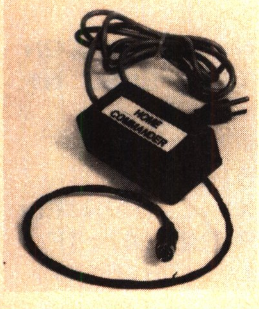
'HOME COMMANDER' $49.95

BSR CONTROL MEETS THE CoCo

CONTROL YOUR WORLD

Give yourself piece of mind while on vacation by programming the HOME COMMANDER to control lamps, radios, TVs and more. Or make life easy on yourself by turning on the coffee pot before you wake up. You can do this and more with the HOME COMMANDER.

NO WIRES NECESSARY



The HOME COMMANDER uses your homes existing electrical wiring to control virtually anything. Appliances are controlled via small control modules (sold separately). The LAMP DIMMER MODULE allows you to turn a lamp on or off and control 16 brightness levels. The APPLIANCE MODULE is used to control appliances up to 400 watts such as a TV, radio, stereo system, fan or motor.

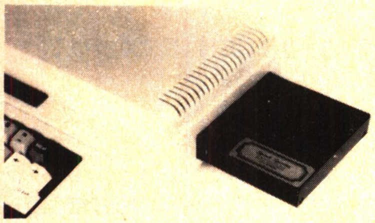
ON FRIDAY 7:42 PM, OFF SUNDAY 1:26 AM

Included FREE is a program to allow you to control up to 256 devices and specify the time and date they are to be activated. That's right, the software has its own built in accurate clock.

LAMP DIMMER MODULE **$16.95** APPLIANCE MODULE **$16.95**

NEW!

PRECISION TIME MODULE $49.95



Now your computer will always know the correct time and date. This amazing precision time module is calibrated to the National Bureau of Standards (WWV) atomic clock and you should never have to change it. Use the PRECISION TIME MODULE to add the time element to your game. Or use on your BBS so that the time will always be perfectly accurate.

BATTERY BACKUP

Even when your computer is off, the clock keeps correct time by operating using the internal battery backup system.

FREE TALKING CLOCK PROGRAM requires VOICE

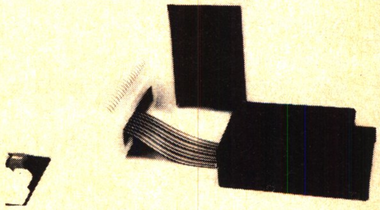
MONTHS, LEAP YEARS & DST

The PRECISON TIME MODULE automatically adjusts for the different number of days in each month as well as leap years. And believe it or not, it adjusts for DST so you don't have to remember if it's SPRING FORWARD or FALL FORWARD.

Y-CABLE $28.95

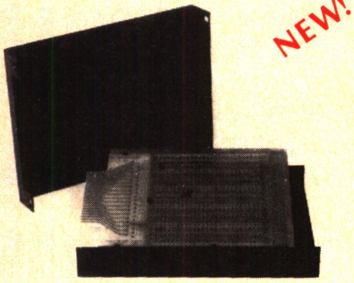
LOWEST PRICE ANYWHERE

Why pay $100 to $200 for a multi-pak. With the Y-CABLE, you can connect your disk system to your computer along with either our STEREO PAK music synthesizer, our VOICE speech synthesizer, or our PRECISION TIME MODULE. All connectors gold plated.



NEW!

ATTENTION EXPERIMENTERS!



Interested in building your own project? Our oversized board gives plenty of room for construction while the sturdy aluminum case with black satin finish assures protection and a professional appearance.

Prototype Board only **$19.95**
Prototype Enclosure only **$19.95**
Buy both for **$29.95**

Need an SC-01? **$29.00**

Disks (any quantity)	$1.49
Tape C-10, C-20	$0.69
Hard Tape Box	$0.29
6821	$2.95
74LS138	$0.79
7407	$0.79
IC sockets 14, 16, 22 pin	$0.29
IC sockets 24, 28, 40	$0.39

FREE BLANK DISK OR TAPE WITH EVERY ORDER

VISA® MasterCard

Dealer Inquiries Invited

We accept CASH, CHECK, COD, VISA and MASTER CARD orders.

Shipping and handling US and Canada	$3.00
Shipping and handling outside the US and Canada	$5.00
COD charge	$2.00

Illinois residents add 6¼% sales tax

Speech Systems

38W 255 DEERPATH ROAD
BATAVIA, ILLINOIS 60510
(312) 879-6880 (VOICE)
(312) 879-6811 (24 HR. BBS)

CALL ANY DAY, ANYTIME TO ORDER. ALSO ORDER BY MAIL OR BBS.

```
460 IFL=23THEN VA=3:VD=29
461 IFL=29THEN VA=1:VD=23
462 IFL=60THEN VA=2:VD=61
463 IFL=59THEN VA=3:VD=66
464 IFL=66THEN VA=1:VD=59
465 IFL=22THEN VA=1:VD=16
466 IFL=16THEN VA=3:VD=22
467 IFL=34THEN VA=2:VD=35
468 IFL=35THEN VA=4:VD=34
469 IFL=61THEN VD=61
470 GOTO3
480 IF A$=A1$THEN GOSUB580:GOTO2
00
481 IF B$=O$(4)AND L=10THEN N$="
IT SAYS:":GOSUB170:N$="DANGER-RA
DIATION BEHIND DOOR!":GOTO6
482 IF B$=O$(6)AND O(14)=1000AND
 L=11THEN N$="IT'S ABOUT THE SIZ
E OF THE DISK.":GOTO6
483 FOR X=1TO25:IF B$=O$(X)THEN4
85ELSE NEXT
484 N$="I DON'T SEE A "+B$:GOTO4
26
485 IF X<14THEN487ELSE Z=X-13:ON
 Z GOTO488,487,489,487,487,487,4
87,490,491,492,494
487 N$=NU$:GOTO6
488 N$="IT'S SILVER, AND HAS GRO
VES LIKE A RECORD.":GOTO6
489 N$="THEY'RE IN A SMALL BOX A
ND SMELL BAD.":GOTO6
490 N$="IMPRINTED ON THE INSIDE
IT SAYS: I WILL PROTECT YOU FROM
 MAGIC.":GOTO6
491 N$="THEY ARE WELL LINED AND
HEAVY.":GOTO6
492 IF O(24)=1000THEN N$="IT CON
TAINS RADIOACTIVE MATTER"ELSE N$
="IT'S EMPTY"
493 GOTO6
494 N$="IT GLOWS!":GOTO6
500 FOR X=1TO6:IF E(X)=L THEN3EL
SE NEXT:FOR X=1TO6:DR=RND(4):IF
T(DR,E(X))>0THEN E(X)=T(DR,E(X))
:BB=1:GOTO510
501 IF T(DR,E(X))=-1THEN LL=L:L=
E(X):XC=VC:XA=VA:XD=VD:GOSUB450:
E(X)=VD:L=LL:VC=XC:VA=XA:VD=XD:B
B=1
510 NEXT:GOTO3
514 Y=RND(7):IF Y=1THEN E(X)=17
515 IF Y=2THEN E(X)=52
516 IF Y=3THEN E(X)=10
517 IF Y>3THEN E(X)=15
518 IF E(X)=L THEN514ELSE3
520 FOR X=1TO4:IF E(X)=L THEN525
521 NEXT:GOTO354
525 IF X<4THEN GOSUB514:N$="THE
ROBOT DISINTIGRATES!":GOSUB530:G
OTO248
526 IF O(21)=1000THEN X=4:N$="YO
U HAVE DESTROYED EVIL ZARKON!":G
OSUB529:GOTO248
527 GOTO354
529 E(X)=6
530 PMODE3:FOR Y=2TO50STEP2:CIRC
LE(130,50),Y,RND(4):SOUND Y,1:NE
XTY:GOSUB5:GOTO750
550 X=6:N$="YOU HAVE DESTROYED T
HE GORMA!":GOSUB529:GOTO248
560 X=5:N$="YOU HAVE KILLED THE
SAND SNAKE!":GOSUB529:GOTO248
570 GOSUB580:GOTO248
580 FOR X=1TO6:IF E(X)=L THEN590
ELSE510
590 ON X GOTO600,600,620,640,660
,680
600 X=RND(17)+10:N$="THE ROBOT F
IRES A RAY":GOSUB5:IF X<23THEN61
0
604 IF X>23AND O(24)=1000THEN N$
="THE LEAD JAR AND RADIOACTIVE M
ATTER ARE GONE!":O(23)=4:O(24)=4
:GOTO5
605 FOR X=11TO22:IF O(X)=1000THE
N610
```

Hint . . .

A common practice in programming is to use a REM to head a subroutine or *GOTO* line. This helps make programs easier to read and follow. However, the REM/title should never be the line referenced by the *GOTO* or *GOSUB*. If you start compacting a program by stripping REMs, you'll have nowhere to *GOTO!* Instead of:

```
10 GOSUB 4000
.
.
.
4000 REM SUBROUTINE TO INCREMENT
SCORE
```

put the REM one line number back:

```
10 GOSUB 4000
.
.
.
3999 REM INCREMENT SCORE
4000 IF K> . . . . .
```

With this format, removing the REM will leave the program untouched.

T. Gray
Sunnybrook, Alberta

DATMAN INTERNATIONAL

VISA 1-416-529-1319 MC

GRAPHIC MASTER

is a program in a class by itself. This extremely powerful, compact program adds 30 NEW COMMANDS to any version of RS COCO BASIC. The commands are more versatile and operate up to 60 TIMES FASTER than Extended Basic. 32 software sprights, dual page flipping, vert. scroll, polygon and dye are just a few of the features you can use in your own programs.

$42.95 (T)US
$46.95 (D)US
$49.95 (T)CN
$53.95 (D)CN

Includes 60 page manual.

TEXT MASTER

is the most comprehensive and powerful text utility available for the COCO. 24 printing sizes, printer echo, key click & repeat, underlining, full English error messages, even proportional and mirror printing. If you wish you may design your own character set and keyboard layout. TEXTMASTER includes an extensive manual in a 3 ring binder.

$25.95 (T)US
$29.95 (D)US
$29.95 (T)CN
$33.95 (D)CN

REQUIRES 64K

LIMITED TIME SPECIAL

SPECIAL

Buy the DISK versions of TEXT MASTER and GRAPHIC MASTER together at a special price and get a FREE 30 MINUTE DEMO.

$69.95 US
$79.95 CN

INCLUDE $2.50 SHIPPING

DATMAN INTERNATIONAL
125 SOUTH FIFTH STREET
LEWISTON, N.Y. 14092

DATMAN INTERNATIONAL
420 FERGUSON AVE. N.
HAMILTON,ONT.,L8L 4Y9

```
606 NEXT:N$="NOTHING HAPPENS!":G
OTO5
610 IF O(X)<>1000THEN604ELSE N$=
"YOU NO LONGER HAVE THE "+O$(X)+
"!":GOSUB5:O(X)=0:GOTO760
620 N$="THE ROBOT FIRES A LASER
RAY!":GOSUB5:X=RND(6)
621 IF X=1THEN N$="IT MISSES!":G
OTO5
622 WN=WN-1:N$="IT HITS YOU!!":G
OSUB5:IF WN<1THEN3000
623 GOTO3
640 X=RND(3):IF X=1THEN650
644 N$="ZARKON ATTACKS WITH MAGI
C!":GOSUB5:IF O(21)=1000THEN648
645 N$="YOU ARE HIT!":GOSUB5:WN=
WN-2:IF WN<1THEN3000
646 GOTO3
648 N$="THE RING PROTECTS YOU!":
GOSUB5:GOTO3
650 N$="ZARKON FIRES A LASER GUN
!":GOSUB5:X=RND(4):IF X=1THEN621
ELSE645
660 N$="THE SAND SNAKE ATTACKS":
GOSUB5:X=RND(7)
664 IF X=1THEN621ELSE645
680 N$="THE GORMA ATTACKS":GOSUB
5:X=RND(8)
684 IF X=1THEN621ELSE WN=WN-1:GO
TO645
700 FF=FF+1:IF F=0THEN3
702 IF FF=10THEN N$="YOU HEAR AN
 EXPLOSION!":GOTO5
704 IF FF=15THEN N$="YOU HEAR A
LARGE EXPLOSION!":GOTO5
706 IF FF=22THEN N$="THE PLANETO
ID EXPLODES AROUND YOU!":GOSUB5:
GOTO3000ELSE3
750 GOSUB1002
752 GOSUB770:GOTO780
760 IF O(X)=0THEN O(X)=RND(71)EL
SE O(X)=RND(30)
761 Y=O(X):IF Y=1OR Y=7OR Y=13OR
 Y=19OR Y=25OR Y=5OR Y=6THEN760E
LSE3
770 FOR X=1TO25:IF O(X)=L THEN N
$=N$+LO$(X)+", ":VB=1:GOSUB800
772 NEXT:GOTO3
780 FORX=1TO6:IF E(X)=L THEN N$=
E$(X)+" IS HERE!":GOSUB900:GOSUB
5
782 GOTO772
800 IF X<11THEN3
801 Z3=3:Z3$="3":PMODE3:Y=X-10:O
N Y GOTO810,815,820,825,830,835,
840,845,850,855,860,865,870,875,
880
810 Z1=90:Z2=64:Z$="94,64":Z3=1:
Y$="U2H4L2G4D2F4D2G12D2F4L2E2NE8
F4R2E2U2NU4F4R4E4U2H4U6H2U4H2E4"
:GOTO890
815 Z1=100:Z2=84:Z$="102,84":Z3=
1:Y$="H4G4F4E4R6ND2R4ND4R2":GOTO
890
820 Z1=50:Z2=82:Z$="52,82":Z3=1:
Y$="G2H2E2F4E4F4E4H2G4H4E4H4E2F2
G4F4G4H4":GOTO890
825 IF L=11AND RIGHT$(LO$(14),1)
="T"THEN826ELSE Z1=74:Z2=86:Z$="
70,86":Z3=4:Y$="U2E4R4F4D2G4L4H4
BR4BE2EFGH":GOTO890
826 DRAW"BM162,58C3E4R4F4L12E1R2
C4R6H2R4":GOTO3
830 Z1=24:Z2=80:Z$="22,82":Z3$="
1":Y$="U22L2U2R6D8F2D6F4BL2NU2BR
4R8U2D8L8H2L4G4H4":GOTO890
835 Z1=104:Z2=86:Z$="102,88":Z3$
="2":Y$="U10R8BD2G2F2E2H2BD4NE4N
F4NG4NH4BU6R8D12L16U2":GOTO890
840 Z1=10:Z2=86:Z$="8,82":Z3=2:Y
$="D14R20U14L20E6F4BG2NU6E8D8L4U
2E2U2E6F4D4":GOTO890
845 Z1=24:Z2=96:Z$="22,98":Z3=4:
Y$="U6E4R6U2R4D2L4R2ND2R6F4D6L20
":GOTO890
850 Z1=48:Z2=94:Z$="46,96":Z3$="
2":Y$="U12NR12E6R22F6D12NL32U12L
12BL2D4G2H2U4BL8BU2U4BD6D4BD2D6R
10NU2R10U6BU2U4BU2U4":GOTO890
855 Z1=66:Z2=96:Z$="64,98":Z3=4:
Y$="U10E4H4E4H4E4R8F4G4F4G4F4R10
D10L24":GOSUB890:DRAW"BU1C2U8R24
D8L24BE4U2R6BU7L6BU8R6BD15D2BR4E
2F2G2H2":GOTO3
860 Z1=110:Z2=96:Z$="108,96":Z3=
2:Y$="NL2E2F2NR2G2H2":GOTO890
865 Z1=92:Z2=96:Z$="90,98":Z3$="
1":Y$="U6H4U2E2F6H2U6E2F2ND4E2F2
ND4E2F2ND4E2F2D12G4L12":GOTO890
870 Z1=120:Z2=96:Z$="118,98":Z3=
2:Y$="U12NR13U2E4R4E2H2G2F2R4F4D
2D12L16":GOTO890
875 IF RIGHT$(LO$(24),3)="JAR"TH
EN3
876 DRAW"BM160,59C3R10U1L10U1R9U
1L7U1R4U1L2BU4U4BR10BD2G4BD4BR2R
4BL20L4BR6BU4H4":GOTO3
880 Z1=120:Z2=94:Z$="118,96":Z3=
4:Z3$="2":Y$="U2E2R6U12L4U16F4U8
D2H4U8BD16F2H8U8E4R8U2H2U6E4R4F4
D6G2D2R8F4D8G8E2BU16D8G4U2D8E4D1
6L4D12R6F2D2L14NU14L14":GOSUB890
882 DRAW"C2BE14BU4U22BR4R4BL8U4N
H4E4U4G2L4H2BE2R3BRBU3L2BDL2BUL2
BU3R6F2D2
884 PMODE3:DRAW"BM126,80C2R4E2F2
```

The HJL-57 Keyboard

Now available for all models,
including CoCo 2.

Radio Shack
TRS-80
COLOR COMPUTER

Compare it with the rest. Then, buy the best.

If you've been thinking about spending good money on a new keyboard for your Color Computer, why not get a good keyboard for your money?

Designed from scratch, the HJL-57 Professional Keyboard is built to unlock ALL the potential performance of your Color Computer. Now, you can do real word processing and sail through lengthy listings...with maximum speed; minimum errors.

At $79.95, the HJL-57 is reasonably priced, but you can find other CoCo keyboards for a few dollars less. So, before you buy, we suggest that you compare.

Compare Design.

The ergonomically-superior HJL-57 has sculptured, low profile keycaps; and the three-color layout is identical to the original CoCo keyboard.

Compare Construction.

The HJL-57 has a rigidized aluminum baseplate for solid, no-flex mounting. Switch contacts are rated for 100 million cycles minimum, and covered by a spill-proof membrane.

Compare Performance.

Offering more than full-travel, bounce-proof keyswitches, the HJL-57 has RFI/EMI shielding that eliminates irritating noise on displays; and four user-definable function keys (one latchable), specially-positioned to avoid inadvertent actuation.

Free Function Key Program

Your HJL-57 kit includes usage instructions and decimal codes produced by the function keys, plus a free sample program that defines the function keys as follows: F1 = Screen dump to printer. F2 = Repeat key (latching). F3 = Lower case upper case flip (if you have lower case capability). F4 = Control key; subtracts 64 from the ASCII value of any key pressed. Runs on disc or tape; extended or standard Basic.

Compare Installation.

Carefully engineered for easy installation, the HJL-57 requires no soldering, drilling or gluing. Simply plug it in and drop it right on the original CoCo mounting posts. Kit includes a new bezel for a totally finished conversion.

Compare Warranties.

The HJL-57 is built so well, it carries a full, one-year warranty. And, it is sold with an exclusive 15-day money-back guarantee.

Compare Value.

You know that a bargain is a bargain only so long as it lasts. If you shop carefully, we think you will agree...The HJL-57 is the last keyboard your CoCo will ever need. And that's **real** value.

Order Today.

Only $79.95, the HJL-57 is available for immediate shipment for either the original Color Computer (sold prior to October, 1982) or the F-version and TDP-100 (introduced in October, 1982), and the new 64K CoCo. **Now also available for CoCo 2.**

Call Toll Free

1-800-828-6968

In New York 1-800-462-4891

HJL
PRODUCTS
Div. of Touchstone Technology Inc.
955 Buffalo Road • P.O. Box 24954
Rochester, New York 14624
Telephone: (716) 235-8358

Ordering Information: Specify model (Original, F-version, or CoCo 2). Payment by C.O.D., check, MasterCard or Visa. Credit card customers include complete card number and expiration date. Add $2.00 for shipping ($3.50 for Canada). New York state residents add 7% sales tax.
Dealer inquiries invited.

POWER
+ PLUS +
TOOLS™
ULTRA TE
Double 80 plus

ULTRA TERM + Plus +

This program is the **ultimate** in CoCo communicating!! Ultra Term + is used with a plug-in 80 column board. Supports either Double 80 Plus, Color Power II or Word Pak.

Here are just some of the features Ultra Term + has to offer:

Select:
- Half, Full Duplex or Echo
- Odd, Even, Mark, Space or No Parity
- 7 or 8 Bit Words
- 1 or 2 Stop Bits
- All Caps if needed
- Several Printer Formats
- Trapping of incoming characters

BAUD Rates:
- 110-4800 (communicate)
- 600-9600 (printer)

Screen Format:
- 80 x 24 upper/lowercase
- Send all 128 characters from keyboard

Buffer:
- Merge text or programs
- 49K to 53K memory
- Four Buffer Send Modes
- Display Bytes Used/Remaining
- Editor—Move forward and reverse thru buffer. Insert, type over, delete lines, characters or words. Block delete.

10 Macro keys
Automatic Capture of incoming files
X on/X off capabilities
Send True Line Break
Transmit/Receive BASIC Programs, Files or Machine Code. No need to translate BASIC programs to ASCII Format.
Save/Load Macros or Parameters to Disk
Use 1 to 4 Disk Drives (w/SAVE, LOAD, DIR & Granule Display)
Print while receiving information*
Easy to use MENU driven format
Comprehensive users manual
Works on All Radio Shack Color Computers, and All Radio Shack Disk systems.

15-day money back guarantee (less a $10.00 restocking/use charge.)
Only $5.00 each for all future upgrades when you return your warranty card.

PRICE:	Ultra Term +	$59.95 (Disk)
	Y-Cable	$29.95
	Double 80 Plus	$99.95
	Complete Package	$189.95 + S&H

*Requires PC Pak from PBJ, Inc.

HARDWARE

DOUBLE SWITCH — Two LEDs show you which port is being used, 1 or 2. High Quality parts with a great looking face plate! $29.95

DOUBLE CABLE — Hook a MODEM and a PRINTER up at the same time with this Y-connector $14.95

EXT-CABLE — long printer or MODEM cable (15 feet) $14.95

Y-CABLE — You can connect two devices at the same time to your ROM port (80 column card and disk Drive) $29.95

DOUBLE DRIVER — Best video driver available for your CoCo. Made by our friends at Moreton Bay Software. Specify CoCo or CoCo II $24.95

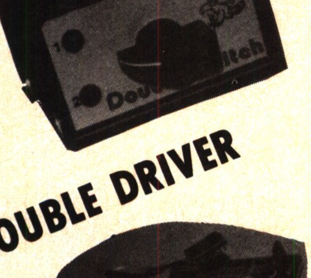
MINI MOUTH — Now get sound from your mute monitor. Plugs right in, nothing to solder $24.95

COLOR POWER II — This plug in CP/M board will allow you to use thousands of CP/M programs $329.00

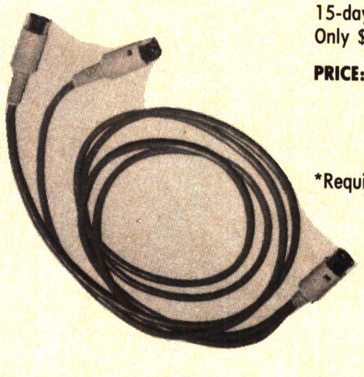
MINI-MODEM — 300 BAUD, Originate/Answer Full Duplex, Direct Connect . $79.95
(Save $10.00 when you buy one of our terminal programs and a modem)

DISKS — DISKS — DISKS — DISKS — DISKS
Save on blank 5¼" diskettes. Buy in bulk and save! No sleeves. (10 minimum in each order) $16.00

DOUBLE SWITCH

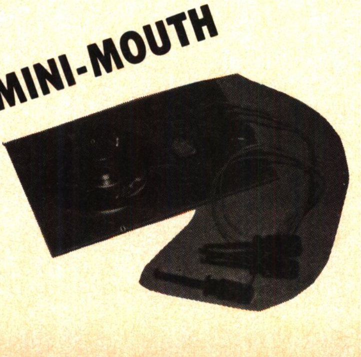


DOUBLE CABLE



DOUBLE DRIVER

MINI-MOUTH



DOUBLE 80 PLUS

TRUE 80 COLUMN OUTPUT
BUILT IN SWITCH FOR COCO OR DOUBLE 80 PLUS
ADJUSTABLE VIDEO OUTPUT
GOLD PLATED EDGE CONNECTOR
DRIVERS AVAILABLE FOR BASIC, OS9 and **FLEX**
DISPLAY ALL ASCII CHARACTERS
ALTERNATE CHARACTER SETS AVAILABLE
METAL CASE (not cheap plastic)
ULTRA TERM+ available for this board
BACKED BY A 90 DAY PARTS AND LABOR WARRANTY

DOUBLE 80 PLUS (80 column board)	$99.95
Y-CABLE	29.95
BASIC DRIVER	12.95
OS9 DRIVER	12.95
FLEX DRIVER (available soon)	12.95
ULTRA TERM+ (disk only)	55.95

COLOR TERM + Plus +

Screen Format:
32 x 16, 42, 51, 64 or 85 x 24

BAUD Rates:
Printer—600 to 9600
Communicate—110 to 19200

Select:
Half or Full Duplex
Odd, Even, or No Parity
7 or 8 Bit words
Mask Lowercase if needed
Word Wrap—no split words
Reverse or Normal Video
Printer—Ignore/Add Line Feeds

Buffer Editor:
Insert, Delete, Type over
Block Delete, Block Insert

Communicate Mode:
Scroll Protect up to 9 lines
Three Buffer Transmit Modes
Send Control Characters

Disk Drives:
Display Directory, Free Space

Buffer:
Scroll Through Received Data
Print a Page or Print All

Works on all Radio Shack Color Computers, regardless of ROM type.

Price: $39.95 (Disk/Tape)

Double Density Software
Color Term Plus
POWER + PLUS + TOOLS™

DOUBLE SPOOLER	No more waiting for your listings. This is THE spooling program!! 32/64K req.	$21.95
ROM MOVE	Move your Extended BASIC 1.0 ROM up higher in memory. Get 8K more for your programs! 64K req.	$12.95
COLOR DISK SAVER	Don't let the disk crasher get you! Archive that important disk to tape. 32/64K req.	$12.95
AUTOLOAD II	Will send most progams to disk automatically and fix those that crash your disk	$12.95
GALACTIC MATH	Addition and multiplication drill (saucer game) for ages 6 to 10. 16K ext.	$15.95
DOUBLE MAILER	A powerful, easy to use mailing list program. Print out 1800 names at once! 16K ext.	$21.95
COLOR BIORHYTHM	Chart your future or past on screen or printer. Popular program for 2 yrs. 16K ext.	$14.95
MODEM CHESS	You and a friend can play chess over the phone! All moves are supported! 16K ext.	$19.95
UNDERGROUND	How do you tame the guardian of Hell's gate?? Find the Golden Apple. 32K (disk)	$19.95
COLOR KEY COMMAND	A powerful programmer's aid for a small price. Auto line number, Macro Keys, Copy Lines, plus more. Add real power to your Computer. Uses no memory in a 64K machine. 16K req.	$19.95

DOUBLE DOS II

Double DOS II—Now use **35,40,**or **80** track (double or single sided) drives, all on one system, all at the same time. All regular disk commands are supported with Double DOS II and are totally transparent to your BASIC programs! You can get up to **158 granules** on a disk using an 80 track drive. These are the added commands:

NEW

BAUD 1-6...change the BAUD rate.
TRACK 35,36,40,80...change number of tracks.
DOUBLE...enable the double sided option.
PDIR...print your directory to printer.
DUMP ON/OFF...send programs without a terminal program.
RATE 6,35...change the head stepping rate.
VIDEO ON/OFF...reverse video without a hardware mod.
SCROLL 1-255...change your screen scrolling speed.
COMMAND...will list all new commands.
DUPE 0,1,2...will allow copy & backup from one side of a drive to another!
DATE...you can enter the month, day and year as an extension to your programs when they are displayed during a DIR command.

We **guarantee** that this program will work using the above commands, with all types of 35, 40 or 80 track drives!

PRICE: $29.95 (DISK ONLY) 64K required

Double Density Software™

620 Kings Row • Denton, Texas 76201 • 817-566-2004

$2.00 shipping and handling on all orders.

MasterCard

VISA

```
R4":PAINT(120,94),1,2:GOTO3
890 FOR Z=1TO4:Z1$="C"+STR$(Z):D
RAW"BM"+Z$+Z1$+Y$:PAINT(Z1,Z2),Z
,Z:NEXTZ
892 DRAW"BM"+Z$+"C"+Z3$+Y$:PAINT
(Z1,Z2),Z3,VAL(Z3$):PMODE4:GOTO3
900 PMODE3:Z1=126:Z2=98:Z$="100,
100":ON X GOTO910,910,910,930,94
0,950
910 Z3=4:Z3$="1":Y$="E16H16U16E1
6R8U4H10U10E10R10F10D10G10D4R8F1
6D16G16F16L60":IF X=3THEN Z3=3
911 X$="L4D4R8U4L4"
912 GOSUB890:DRAW"C0R30BU30"+X$+
"BL10"+X$+"BR20"+X$+"BH10"+X$+"B
H10"+X$+"BR10"+X$:DRAW"BR10"+X$+
"BH10BU4NL8NR8BU10L6E2R10F2L8BU1
4L4"+X$+"ND2BR12ND2"+X$:GOTO3
930 Z3=1:Z3$="2":Y$="U30H4U4E2U2
0E4R4U4H2U2E8R2E2R4F2R2F8D6F6D26
G4D30L34
932 GOSUB890:PMODE3:DRAW"C2R4E4U
12E2U34E4R2U6C3L2U4H4U4E4R6F4D4G
4D4L4U2R4U2L4BU6BL2L2BR6R2BL12C2
D6F6R4E6U4E2U4D10F6BL16D4F4D20C3
L8R8C2D14F2D12F4R6U60BG30E4U4H4L
2G4BR4C3D4L2R4U2R2ND2NU2NG8E8C4E
2":GOTO3
940 Z3=2:Z3$="3":Y$="H4U4E4H4U4E
4H4U4E4R10H6U8H6U6E6R14F6D6G6D8F
6R8F4D4G4F4D4G4R20E4R8E2R6G6L4G8
L20G4L30
942 GOSUB890:PMODE3:DRAW"C3R30E4
U4H4G2L24H2BU12F2R24E2BU12L20BU2
6C4L6DR4BR6R4UL6UC1L8R2ND2R8ND2R
2BD8F2H4L6NG4DC4D2BR6U2":GOTO3
950 Z3=3:Z3$="1":Y$="E8U8H12E4G1
2H4F8R6F6G2L2H4L6G4D8G2H2U8H6L6G
6R2H2U4E4R12L2H6U2E26R18NF6U4H8U
12F6R6NF2L6E4R12F4L6NG2R6E6D12G8
D4NG6R18E12F2H20L6G6L2H2U2E6R8E6
U8E2F2D8F6R10F8D2G2R2H8L6F18D2G2
6L10NH2R2D6G12D8F8L42
952 GOSUB890:DRAW"C0R8BU24F4R4BR
10R4E4BU4G4L4BL10L4H4BU4F4R4BR10
R4E4BU20BL6C1U4RND4C0NE2L9NH2DC1
D3RU3R2C0R4":PMODE3:DRAW"BU10BR4
C1U2C4F2G2H2E2BL12F2G2H2E2D2C1U
960 GOTO3
1000 PCLS1
1002 PMODE3:COLOR1:LINE(0,0)-(25
5,100),PSET,BF
1005 IF L>40THEN1010
1006 ON L GOTO1101,1102,1103,110
4,1106,3,1107,1108,1126,1110,111
1,1112,1113,1114,1115,1116,1117,
1118,1119,1120,1121,1122,1122,11
24,1125,1126,1127,1128,1129,1102
,1131,1132,1133,1134,9,9,9,1138,
8,8
1010 X=L-40:ON X GOTO8,9,9,9,114
5,8,8,8,9,9,9,1152,1153,1154,9,9
,9,1120,1159,1160,9,9,9,9,1126,1
129,1102,9,9,9,9
1101 DRAW"BM0,20C3R4E2D16F8D8F6D
6F4D8E4D6F8R6F10D6R172U40NL202U3
0L10E20R30D20L30":PAINT(80,84),3
,3:CIRCLE(88,64),32,3,.5,.5:PAIN
T(88,50),4,3:PAINT(222,28),2,3:Y
=12:GOTO1225
1102 GOSUB1201:DRAW"BM150,50R50L
10U10L10NF10D10NE10L4U8L6D8L6U16
H4L4G4NR12D16BL80C3R4L2C4U10D20G
4D4R8U4H4":GOTO1208
1103 GOSUB1201:GOSUB1192:DRAW"BM
150,90"+X$+"BL136U30L30D40R30U10
":GOTO1190
1104 GOSUB1201:DRAW"BM80,90":GOT
O1196
1106 GOSUB1201:GOSUB1192:DRAW"BM
40,84"+X$+"BL58U4"+X$:GOTO3
1107 DRAW"BM0,0C4F20D60NG20U60F1
0D40NG10E8U4NR216NF44U20NH8F2U4H
2U4H2U4H2U4H20":PAINT(2,0),2,4:G
OSUB1212:PAINT(98,96),3,4:Y=40:G
OTO1220
1108 GOSUB1112:GOTO1214
1110 GOSUB1108:DRAW"BM140,50C3R2
0DL20DR20DL20DR20DL20C1U6R20D14L
20U10BR4R12UL12BD6R12BD2L4BL2L6"
:GOTO3
1111 GOSUB2:DRAW"BM20,20":GOSUB1
206:DRAW"BM100,80U50R50D50R4U24B
```

DISK
$44.95

NEW

Introducing The "Super Smart"

DATA PACK II
TERMINAL COMMUNICATIONS SOFTWARE

Also Supports The PBJ 80 Column "Word Pak", Deluxe RS-232 Pak, Parallel Printer Card and PBJ 2SP Pak

NEW

TAPE
$34.95

28-64x24 Hi-Resolution Display

64K Support Up To 55K Text Buffer

"FEATURES"

- No Lost Information When Using Hi-Resolution Display On Line
- ASCII Compatible File Format
- Full Text Buffering
- Terminal Baud Rates 300 to 9600
- Automatic Word Wrap Eliminates Split Words
- Full/Half Duplex
- Automatic File Capture
- Programmable Word Length, Parity and Stop Bits
- Save and Load Text Buffer and Program Key Buffers to Tape or Disk
- 9 Hi-Resolution Display Formats, 28 to 255 x 24
- True Upper/lower Case Display
- Kill Graphics Option for an Extra 6K
- Supports Line Break
- Freeze Display and Review Information On Line
- Send Files Directly from Buffer or Disk
- Full Disk Support for Disk Version
- Send Control Codes from Keyboard
- Separate Printer Baud Rates 110-9600
- Display on Screen or Output Contents of Buffer to Printer
- Automatic Memory Sense 16-64K
- 9 Programmable Function Key Variable Length Macro Buffer
- Programmable Prompt Character or Delay to Send Next Line
- Programmable Control Character Trapping
- Programmable Open/Close Buffer Characters
- Automatic Key Repeat For Editing
- Program and Memory Status Displays

9 Unlimited Variable Length Macro Key Buffers

BUFFER EDITOR Insert, Delete Change or Add To Buffer

NEW!!!

"The Wait is Finally Over"

ANNOUNCING
The CBASIC COMPILER

Now anyone can create fast efficient Machine Language Programs without the Drudgery of using an Assembler.

NEW!!!

CBASIC is a fast Machine Language integer Basic Complier that can convert Color Basic programs into fast machine language programs. CBASIC features over 100 Basic Commands and functions that fully support Disk, Tape, Screen and Printer I/O, Hi & Low Resolution Graphics, Sound, Play and String Operations just like Color Basic. CBASIC also includes a powerful full featured Basic program Editor using a 51,64 or 85 by 24 line display. The Hi-Resolution display can be automatically included in your compiled program for enhanced display capability and allow mixed text and graphic displays.

Graphics Commands:	CIRCLE, COLOR, CLS, DRAW, GET, LINE, PAINT, PCLS, PCOPY, PMODE, PRESET, PSET, PUT, RESET, SCREEN, SET, POINT, PPOINT
Sound Commands:	PLAY, SOUND
String Functions:	CHR$, LEFT$, MID$, RIGHT$, LEN, INSTR, LSET, RSET, TRM$, STR$, STRING$, INKEY$, MKN$
Numeric Functions:	ABS, POS, TIMER, RND, ASC, TAB, CAL, JOYSTK, PEEK, POKE, LOC, LOF, EOF, FREE, CVN, ERR, VARPTR, SWAP
I/O Commands:	OPEN, CLOSE, INPUT, LINEINPUT, PRINT WRITE, PRINT @, GET, PUT, KILL, CHAINM, FIELD, DATA, READ, RESTORE
Program Control:	FOR/NEXT/STEP, GOTO/GOSUB, IF/THEN/ELSE, RETURN, STOP, RETI, ON n GOTO/GOSUB, ON ERROR, ON RESET, ON IRQ/FIRQ/NMI, ON OVR/NOVR, EXEC, LET
Directives:	ORG, REM OR ', END, DIM, END, BASE, RAM, ON/OFF, RAM64K, HIRES, GENERATE, DPSET, STACK
Editor Commands:	LINE EDIT, AUTO EDIT, COPY, MOVE, RENUMBER, AUTO LINE#, PRINTER, LIST, DELETE, SEARCH, REPLACE, BAUD RATE, PRINTER, CBASIC, TAPPEND, SKIP, SIZE, LOAD, SAVE, APPEND, KILL, DIR, and much, much more.

REQUIRES 32K and Disk, 64K recommended

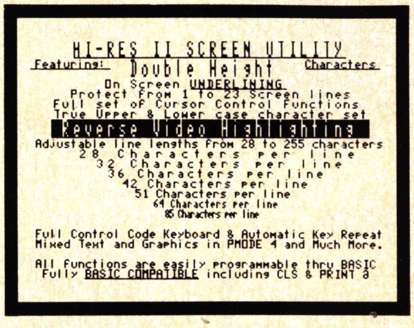
Introductory Price $119.00
Regularly $149.00

HI — RES II SCREEN UTILITY

NEW IMPROVED VERSION

- ***UP TO 85 CHARACTERS PER LINE READABILITY***
- ***ADJUSTABLE AUTOMATIC KEY REPEAT***
- ***PROPTECT 1-23 SCREEN LINES***
- ***CONTROL CODE KEYBOARD***

- FULLY BASIC COMPATIBLE
- DISPLAY FORMATS OF 28 to 255 CHARACTERS PER LINE
- FULL 96 UPPER/LOWER CASE CHARACTERS
- MIXED GRAPHICS & TEXT OR SEPARATE GRAPHIC & TEXT SCREENS
- INDIVIDUAL CHARACTER HIGHLIGHTING
- REVERSE CHARACTER HIGHLIGHT MODE
- WRITTEN IN FAST MACHINE LANGUAGE
- AUTOMATIC RELOCATES TO TOP OF 16/32K
- AUTOMATICALLY SUPPORTS 64K of RAM WITH RESET CONTROL
- REVERSE SCREEN
- ON SCREEN UNDERLINE
- DOUBLE SIZE CHARACTERS
- ERASE TO END OF LINE
- ERASE TO END OF SCREEN
- HOME CURSOR
- BELL TONE CHARACTER
- HOME CURSOR & CLEAR SCREEN
- REQUIRES ONLY 2K OF RAM
- COMPATIBLE WITH ALL TAPE & DISK SYSTEMS



```
HI-RES II SCREEN UTILITY
Featuring:  Double Height  Characters
On Screen UNDERLINING
Protect from 1 to 23 Screen lines
Full set of Cursor Control Functions
True Upper & Lower case character set
Reverse Video Highlighting
Adjustable line lengths from 28 to 255 characters
28 Characters per line
32 Characters per line
36 Characters per line
42 Characters per line
51 Characters per line
64 Characters per line
85 Characters per line

Full Control Code Keyboard & Automatic Key Repeat
Mixed Text and Graphics in PMODE 4 and Much More.

All functions are easily programmable thru BASIC
Fully BASIC COMPATIBLE including CLS & PRINT @
```

$24.95 TAPE **$29.95** DISK

ALL ORDERS SHIPPED FROM STOCK
ADD $2.50 POSTAGE

CER COMP
5566 Ricochet Avenue Las Vegas, Nevada 89110
(702) 452-0632

Screen Enhancement Program Comparison Chart

PROGRAM FEATURES	**HI-RES II** NEW	**HI-RES I** OLD	**BRAND X**
Upper/Lower case characters	Yes	Yes	Yes
Mixed Text and Graphics	Yes	Yes	Yes
Separate Text & Graphics	Yes	Yes	No
Print @ fully implemented	Yes	Yes	Yes
Print @ on all line lengths	Yes	Yes	51 only
Different line lengths	28 to 255 (9)	28 to 255 (9)	51 only (1)
Automatic Key Repeat	Yes	Yes	Yes
Adjustable Key Repeat	Yes	No	No
Auto Repeat Disable	Yes	No	No
Erase to end of line/screen	Yes	Yes	Yes
Home Cursor	Yes	Yes	Yes
Solid or Blinking Cursor	Yes	No	Yes
CLS command supported	Buff/Black	Buff/Black	Buff/Black
X,Y Coordinate Cursor Positioning	Yes	Yes	No
Double Size Characters	Yes	Yes	No
Individual/Continuous Highlighting	Yes	Yes	No
On Screen Underlining	Yes	Yes	No
Clear Key functional	Clear/L keys	Clear key	No
16.32 & 64K Supported	Yes	Yes	Yes
Green or Black Background Color	Yes	No	No
Dual Character sets for Enhanced 64 and 85 Characters per line display	Yes	No	No
Protected Screen Lines (programmable)	1 to 23	No	No
Full Control Code Keyboard for Screen control directly from the keyboard	Yes	No	No
Programmable Tab Character Spacing	Yes	No	No
Full Screen Reverse Function	Yes	Yes	No
Switch to & from the Standard 16 by 32 Screen for full compatability	Yes	No	No
On Error Goto Function	No	No	Yes
Extended Basic Required	No	Yes	Yes
All Machine Language Program	Yes	Yes	Yes
RAM Required in addition to Screen RAM	2K	2K	2K
Program Price (Tape)	$24.95	$19.95	$29.95

VISA, MASTERCARD AND C.O.D. ACCEPTED

```
R4D4R20U4L20BL4U30L58D54":GOSUB1
155:GOTO1208
1112 GOSUB4:GOTO1208
1113 DRAW"BM0,0C4F20D60NG20E10U4
0NH10F4U4H2U4H2U4H2U4H12":PAINT(
2,0),2,4:DRAW"BM255,60C4L222F40"
:GOSUB1210:PAINT(98,96),3,4:DRAW
"S6":Y=40:GOTO1220
1114 GOSUB1203:GOSUB1205:GOSUB12
06:DRAW"BM36,36D10C4H4D26BR190U2
6G2D22BL100BU2U20R18D20L2C1L14":
GOTO1208
1115 GOSUB1202:GOSUB1213:GOSUB12
15:DRAW"BR80R20C4U30L20D30":GOTO
1208
1116 GOSUB2:GOSUB1211:GOSUB1230:
GOTO1208
1117 GOSUB1201:GOSUB1230:DRAW"U2
6BR36U8R4D8L4U4R2C3U2":GOTO1208
1118 GOSUB1104:DRAW"BM20,20C4":G
OSUB1205:DRAW"BM20,20":GOSUB1206
:GOSUB1194:DRAW"BM40,80"+X$:GOTO
3
1119 DRAW"BM0,20C4F20L4NL16D28NR
238D12ND20R20F20":PAINT(0,26),2,
4:PAINT(90,90),3,4:DRAW"S8":Y=30
:GOTO1220
1120 GOSUB1202:GOSUB1215:GOTO120
8
1121 GOSUB1201:GOSUB1211:DRAW"BM
50,90C2":GOSUB1228:DRAW"BM70,92"
:GOSUB1229:PAINT(56,82),4,2:PAIN
T(70,74),4,2:PAINT(52,74),4,2:GO
TO3
1122 GOSUB1201:GOSUB1211:DRAW"BM
0,70R4E2R4E2R4E2R216F2R4F2":PAIN
T(2,72),2,4:PAINT(50,66),2,4:PAI
NT(238,70),2,4:DRAW"BM94,80D16F6
R12E6U4NL24U12L3BU40E2U4H4L12G4D
4F2R2E2R6F2NR2BH2C2L6GFGFGFGBU7R
4GFGFGFGBU7R3FGFGFGFBU7R2DBDDBDD
BDD":IF L=22THEN1240ELSE3
1124 GOSUB1103:GOTO1208
1125 DRAW"BM0,10C4F6R170F2R6F20N
D60R60D40G20L250BU60BR204L60U20R
34":PAINT(0,14),2,4:PAINT(250,50
),4,4:DRAW"BD79C1R20U50L10G8L10U
4D8U4R10G8D6R8D22G6R6BU28L50U6NR
40U16NR56D50R50L20C3L20R10U24R10
L20U20R2D6BR8U10R14D10L14BU60BL6
0C1D100L80U88":GOTO1195
1126 GOSUB2:GOTO1208
1127 GOSUB1203:GOSUB1210:DRAW"BM
36,36D6H2D24G2U28D28E2R80U20R20D
20L2C1L16":GOTO1208
1128 GOSUB1202:GOSUB1212:DRAW"BM
116,70C4U30R30D30L2C1L26":GOTO12
08
1129 GOSUB1132:GOTO1210
1131 GOSUB4:DRAW"BM40,90":GOSUB1
196:X=196:Z=4:DRAW"BM188,86":GOT
O1197
1132 GOSUB1201:GOSUB1230:GOTO120
8
1133 GOSUB2:GOSUB1206:DRAW"BM60,
84":GOSUB1196:X$="U10L2D10BL4":D
RAW"BM180,52C3U10H2L2G2D2BL20C2D
9L4U9L1R5D7L2C3BL20BD2C3"+X$+X$+
"C2"+X$+"C3"+X$+X$+"C4U6R40D6":G
OTO3
1134 GOSUB1201:GOSUB1214:X=3:GOS
UB1231:X=30:Z=4:DRAW"BM22,84":GO
SUB1197:X=200:DRAW"BM192,84":GOT
O1197
1138 GOSUB1201:GOSUB1214:DRAW"BM
20,90C2":GOSUB1228:DRAW"BM40,92"
:GOSUB1229:PAINT(24,82),4,2:PAIN
T(38,74),4,2:PAINT(22,74),4,2:X=
196:Z=2:DRAW"BM188,86":GOTO1197
1145 GOSUB1201:GOSUB1214:GOTO120
8
1152 GOSUB2:GOSUB1206:GOTO1208
1153 GOSUB1202:GOSUB1215:GOSUB12
16:GOTO1208
1154 GOSUB1203:GOSUB1205:GOSUB12
06:DRAW"BM36,46C4H4D26BR190U26G4
```

Co Co - Cooler

RAINBOW

- Brings operating temperature to ambient, regardless of accessory load
- Reduces temperature of ENTIRE computer . . . not just the SAM chip
- Easy 1-minute installation
- $39.95

Companion Keyboard Cover $7.95
Co Co Software
NOW SHIPPING

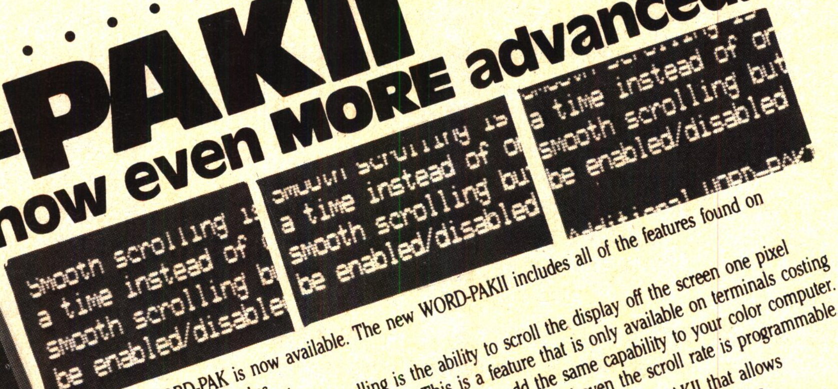
Co Co - Cooler Too

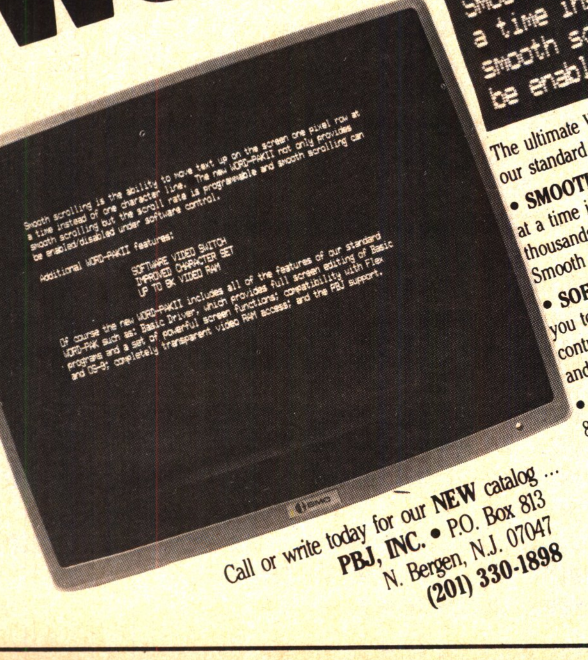
(Same Price, Same Fit, For Color Computer II)

- For Fastest Service Send Money Order Or Certified Check
- Add $2.00 Shipping For Continental U.S.
- Add $4.00 Shipping For Alaska, Hawaii, Canada, & APO's
- Add $15.00 Shipping For Overseas
- Add $3.00 For 220-250 Volt Model
- Calif. Residents Add 6½% Sales Tax
- Will Ship C.O.D. On U.S.A. Shipments Only
- All Merchandise Shipped From Stock

REM Industries, Inc.
9420 "B" Lurline Ave., Chatsworth, CA 91311
(818) 341-3719

```
":GOTO1208
1155 IF RIGHT$(LO$(14),1)="T"THE
N3
1156 DRAW"C3"
1157 DRAW"BM106,79U48BR8D48BR8U4
8BR6D48BR8U48BR8D48":GOTO3
1159 GOSUB1201:DRAW"C1NR80NH10D6
0NR80G10C3U80R80D80NL80E10U60H10
C2G20L40NH20D20NG20R40NU20F20NL8
0R2E2R2E2R2":PAINT(40,40),4,2:GO
TO1170
1160 GOSUB1201:GOSUB1210:GOTO120
8
1170 DRAW"BM140,86C4U20L2R64L2D2
0L4U4L26U2C1NR28C4U10L26D10C1NL2
C4D6L4":PAINT(142,84),2,4:DRAW"C
1BE18BR16R12BD2L4BU2R12D4BD2D6L2
0U6R12BD2L4BU2R12BU2L20U4BH2C4L4
H2L18G2E4R14F2H2U10L14D10BR56U10
R8D10L8"
1171 PAINT(210,60),2,4:DRAW"U8R2
C3R4":PSET(210,60,3):GOTO3
1190 IF L=9THEN X=2ELSE X=4
1191 PAINT(60,80),X,2:X$="C1U8L1
0D2NL2U2L12D8R22":DRAW"BM68,60"+
X$:DRAW"BM68,70"+X$:DRAW"BM68,80
"+X$:GOTO3
1192 X$="C2U16D8R60ND8U2L60UR60U
L60UR60NU4H4L6G4R12":GOTO3
1194 X$="C2U10E2R2F2D2ND8G2L2H2D
10R2U2L2R36D2L2U2R2L6U10E2R2F2D2
ND10G2L2H2D2L24BU6BL2U14E4R20F4D
14BL4BD4H2L16G2":GOTO3
1195 PAINT(176,64),1,1:PAINT(160
,54),1,3:DRAW"BM160,68C4U4R4D4L4
BU16L8BD2R5":GOTO3
1196 DRAW"C2U30L2R124L2D30L120":
PAINT(82,80),4,2:DRAW"C1BE2":FOR
 X=1TO6:DRAW"U14BU4U6R8D2R2U2L2R
8D6NL16BD4NL16D6L2ND2R2D8NL16BR4
":GOTO510
1197 DRAW"C2U60R40D60L4U4L32D4L4
":PAINT(X,76),3,2:PAINT(X,76),Z,
2:DRAW"U8BR6C1R28U48L28D48R14U24
NU24BR4R2BL10L2":GOTO3
1201 DRAW"BM0,0C4F20D60NG20R214N
F20U60NE20L214":GOTO3
1202 DRAW"BM0,0C4F30D40NG30R192N
F30U40NE30L192":GOTO3
1203 DRAW"BM0,0C4F36D28NG36R182N
F36U28NE36L180":GOTO3
1205 DRAW"BM0,100C4E4U80F10D56NL
10D4C1G8C4":GOTO3
1206 DRAW"BM254,100C4H4U80G10D56
NR10D4C1F8C4":GOTO3
1208 PAINT(0,4),2,4:PAINT(50,50)
```





pbj inc.

INTRODUCES . . . . WORD-PAKII now even MORE advanced.

The ultimate WORD-PAK is now available. The new WORD-PAKII includes all of the features found on our standard WORD-PAK plus ...

• **SMOOTH SCROLLING:** Smooth scrolling is the ability to scroll the display off the screen one pixel at a time instead of one character line at a time. This is a feature that is only available on terminals costing thousands of dollars and *then only on some*. Now you can add the same capability to your color computer. Smooth scrolling can be enabled/disabled under software control and even the scroll rate is programmable.

• **SOFTWARE VIDEO SWITCH:** We have added a video switch to the WORD-PAKII that allows you to select either the computer's normal video output* or the WORD-PAKII's under software control. Optimized programs can now be written to take advantage of both displays ... graphics or text, and switch back and forth under software control.

• **IMPROVED CHARACTER SET:** The characters on the WORD-PAKII are formed in an 8×10 matrix. This allows for well defined characters and full descenders. Custom character sets are also available to suit any application.

• **8K VIDEO RAM:** We have increased the amount of video RAM available on the WORD-PAKII. The board is normally supplied with 2K of RAM and is expandable to 8K.

*Requires composite video out of computer

• **PBJ SUPPORT:** YOU CAN DEPEND ON THE SAME SUPPORT THAT HAS GAINED US THE REPUTATION OF

"THE COMPANY WITH THE MOST SUPPORT FOR THE COLOR COMPUTER".

Call or write today for our **NEW** catalog ...
PBJ, INC. • P.O. Box 813
N. Bergen, N.J. 07047
(201) 330-1898

```
,2,4:PAINT(255,4),2,4:GOTO3
1210 DRAW"BM0,20F10D30BL2H2G2F2E
2BR2D30":PAINT(2,26),2,4:GOTO3
1211 DRAW"BM255,20G10D30BR2F2E2H
2G2BL2D30":PAINT(252,26),2,4:GOT
O3
1212 DRAW"BM20,40ND40F6D14L2D2R2
U2D14":PAINT(22,44),2,4:GOTO3
1213 DRAW"BM235,40ND40G6D14R2D2L
2U2D14":PAINT(232,44),2,4:GOTO3
1214 DRAW"BM100,80C4U40R30D20BL4
H2G2F2E2BR4D20L30":PAINT(102,79)
,2,4:GOTO3
1215 DRAW"BM30,40C4H6D42E2C1E4":
GOTO3
1216 DRAW"BM222,40C4E6D42H2C1H4"
:GOTO3
1220 DRAW"BM150,50C2R10F4R4L4G4L
10D4R6NE2L10R4U4L4U6L4D2R2L2D4R4
L20G4R6NE2L10R4U4R4L16U8L4D6R4U2
NR20U6E2H2E2H2R4F2R2F2R2F2R2F2R2
F2R20H4L10G4S4":PAINT(150,52),3,
2:PAINT(150,52),4,2:PAINT(20,96)
,4,4
1225 FOR X=1TO60:PSET(RND(200)+Y
,RND(50),RND(3)+1):NEXTX:GOTO3
1228 DRAW"U20D10R12L2D10U6L6ND2L
4E4R10NG4D6U10R2L12D4U14G4":GOTO
3
1229 DRAW"U16L8E6R60G6L4ND8L48D4
R4ND8R40E4D12BG4U16":GOTO3
1230 DRAW"BM110,80C1R30C4U40L30D
40":GOTO3
1231 CIRCLE(130,100),80,4,.14,.5
:PAINT(130,98),X,4:GOTO3
1240 DRAW"BM40,12D4C3D38C4L2G2D2
F2R2E2U2H2BR6F2D2G2L2H2U2E2R2C3U
40C4U2BD70C3L4G4D3F4R4E4U3H4":PA
INT(46,86),3,3:DRAW"C1BD2G6BU8F8
":GOTO3
1245 DRAW"BM0,30C3E2D2E2F2U2E4F6
D30F2D30R20NU40E4R6E4R60U30E4U30
E6R2F4E6F4D4F2E2F4E2U4E6R2F4D20F
4D44R20F4R10F4R30U30E4U30E4F2D4F
2E2U2E2F4E4BU30G8D4G2H2U6H4G6D4G
4H2U2H4U2G8D4G8U4H6G8D2G4H6U4G4D
2H8D6H8BL40G10D2G4H4U6H6L2G4D6G2
D4G2ND4H2U6H4U2H6
1246 DRAW"G4D4G2D6G2H2U4H6R2D4G6
D4G4ND4H8U4H6G4H8G4H6U4H8G8R2
1247 DRAW"BR4BD6D4G4BR20F6D4G6D8
BR20G6H4BR30D6F4R6F8BU20U6H4BR24
D6G4BD16NH8D6G4BR90U4H8BR10BU20E
4R6F10BF20D6G4BH10U4H6BE16D4E8BG
46BR2U8E8BF8BD14U6E8U4E6BL162ND1
8NE6BH4D24U30H4"
1248 IF L=36OR L=37 OR L=71THEND
RAW"BM236,30C1D30G4D28C3F8R16":I
F L<>36 THEN DRAW"BM112,84C1NU40
C3E6R40F6U2C1NU40":IF L=37 THEN
DRAW"BM0,100C3R10E8U6NE8U2C1U26H
2U20
1249 PAINT(2,2),3,3:PAINT(2,14),
2,3:PSET(2,24,2):PAINT(200,24),2
,3
1250 IF L=61OR L=35THEN DRAW"BM1
12,84R2E8U40R32D20BL2H2G2F2E2BR2
D20NF8L32":PAINT(130,70),2,3
1251 IF L=56THEN X=2:GOTO1231ELS
E3
1275 GOSUB2:GOSUB1206:GOSUB1230:
DRAW"BM20,0F12R80U12BR20D12R84E1
2":PAINT(40,0),4,4:PAINT(200,0),
4,4
1276 DRAW"BM14,86C1NE8C3R86E6C1N
L88C3U10L86C1ND8C3G6ND10R86ND10E
6BR40D10C1NR88C3F6R88C1NH8C3U10H
6C1ND8C3L88F6ND10R88"
1277 FOR X=62TO196STEP43:PAINT(X
,78),2,3:NEXTX
1278 DRAW"BM20,74C2":GOSUB1290:D
RAW"BR54":GOTO1290
1290 FOR X=1TO20:X$=STR$((RND(8)
*2)+2):Y$=STR$((RND(4)*2)+2):DRA
W"U"+X$+"NH"+Y$+"NU"+Y$+"NE"+Y$+
"D"+X$+"BR4":GOTO510
2000 GOSUB415:PLAY"L99":GOSUB10:
N$="THE SHIP TAKES OFF FOR HOME!
":GOSUB5
2018 IF O(25)=1000OR O(25)=25THE
N N$="YOU SAVED "+LO$(25):GOSUB1
0:F1=1ELSE N$="YOU DID NOT SAVE
"+LO$(25):GOSUB12
2020 GOSUB5:FOR X=17TO20:IF O(X)
<>25AND O(X)<>1000THEN2040ELSE N
EXT:N$="YOU SAVED ALL "+LO$(25)+
"'S EQUIPMENT!":F2=1:GOSUB10
2022 GOSUB5:IF F=1THEN X$="YOU D
ESTROYED":GOSUB10ELSE X$="YOU DI
D NOT DESTROY":GOSUB12
2023 N$=X$+" THE PLANETOID!"
2024 GOSUB5:IF F=1AND F1=1AND F2
=1THEN N$="       PERFECT MISSION
!":GOSUB15ELSE N$="BETTER LUCK N
EXT TIME!":GOSUB12
2030 GOTO3002
2040 N$="YOU MISSED SOME OF "+LO
$(25)+"'S EQUIPMENT!":GOSUB12:GO
TO2022
3000 N$="YOU ARE DEAD!!"
3001 PLAY"O1GFD#DC"
3002 GOSUB5:N$="PLAY AGAIN?":GOS
UB5
3003 X$=INKEY$:IF X$="Y"THEN RUN
3004 IF X$="N"THEN END
3005 GOTO3003
```

WHERE'S-IT

by C.E. Laidlaw

What programs are on this disk? Which disk is my WIDGET program? WHERE'S-IT will answer these questions for you and maintain disk directory index files with up to 972 programs in each. Completely user-friendly, just run WHERE'S-IT and follow the prompts to:

Create index files holding up to 972 programs

Load or save existing index files

Add, delete or update index files for a specific disk

Sort index files alphabetically with a machine language sort

List index files to screen

Print index out with 162 programs to the page

Disk only......$19.95
(32K Extended Color BASIC)

We are also a dealer for the following companies:

Moreton Bay Software
Computerware
Spectrum Projects
Mark Data, Amdek, Epson
Pal Creations, Tom Mix
PBH Computer, Inc.
Spectral Associates,
Cognitec, Elite Software
Prickly Pear, Botek
Cobra Software
and many more fine companies.

JARB
SOFTWARE
HARDWARE

1636 D Avenue, Suite C
National City, CA 92050
After hours:
BBS 619-474-8981
Orderline:
619-474-8982

T.A.G.
THE ADVENTURE GENERATOR

ADVENTURE
©1984
JARB SOFTWARE

Cassette......$34.95
Disk/Amdisk......$39.95

FEATURES

Creates stand-alone programs
Up to 100 rooms, 60 objects, 30 command words, and 9 conditional flags
Supports tape and disk output
Optional printer output of important sections during creation of ADVENTURE
Complete documentation
Includes sample ADVENTURE
Works with all models of the CoCo except MC-10
Requires 32K Extended Color BASIC

NEW

GRAY LADY

by Terry A. Steen

Control your submarine in its efforts to destroy the enemy fleet. You must launch your sub to surface missiles while avoiding the depth charges. Five different types, hi-res graphics and spectacular sounds. Also a talking version included at no extra charge for those who have an SC01 based voice pack. Four screens and progressive difficulty make this all machine language program a real bargain.

Cassette: $19.95 Disk/Amdisk: $24.95

U.S. COD orders accepted, no charge cards please.
Shipping and handling $3.00
California residents please add 6% sales tax

ADVENTURE CONTEST WINNER

16K BEST OF SHOW

THE HEAD of the BEAST

Program By Mark Nelson

Deep in thought, Jon stepped through the doorway of the small, moss-covered cabin. The cold, damp fog fled before him as the warm air inside burst out into the night. He could barely distinguish the edge of the forest that surrounded him, but he didn't need to see it clearly to know where every tree stood, where every vine hung. Wilmouth Forest was the only world he had ever known, and he knew it well.

The cool night air and the familiar sight of the forest brought a torrent of memories rushing to the surface of his troubled mind —memories that he had been able to put aside for the past two years. Had it been that long? Had it been two whole years since he had last hunted game in the forest at his father's side — since his mother and father had walked happily into the forest and never returned? What unspeakable fate had befallen them? It was difficult to examine these questions without tears welling up in the young man's eyes.

But it was time, and time past for such examination. The world that Jon once knew in the peaceful confines of Wilmouth Forest existed no longer. It had become foul and obscene. Where once roamed brave and noble knights along the byways, now skulked only base criminals pretending to be the knights they had once cowered before. Where once young maidens had gathered mushrooms from the dawn-streaked, dew-stippled forest floor, hags now collected dung and rotting matter for their vile concoctions. And where once could be found hart and boar to rival any in the land, only the most unearthly creatures were now reported by those fortunate enough to see them in time to escape unscathed.

Evil begets evil; so it is and so it has always been. And all of the evil now ensconced in the boughs of the woods could be traced to a single cause: The coming of The Beast to Wilmouth Forest. From that day hence, joy and peace were known no more in the Kingdom of Daethnon.

Jon knew of The Beast only by the terrified tales of those who happened to stumble into the clearing surrounding his hut, clawed and mangled and beyond wit's bounds. He himself had scarcely gone beyond the outlying trees since his parents had fallen victim to the shadows beyond, and not once had he ventured outside the hut after nightfall. But this fact alone spoke no ill of the young man. The tales and the sight of those unfortunate souls were enough to paralyze even the stoutest heart.

Tonight, though, a new resolve had come over Jon in his solitude. Shaking off the bonds of fear, he had thrown open the door of the hovel and taken the first brave steps into the night. No more would he cower before the fire, held prisoner by an unseen and nameless terror. And no more would he allow the death of his parents to go unavenged.

(Mark Nelson, a computer science student at Utah Technical College, also works as the head of the computer department in a local electronics store. This is his first published program.)

16K ECB

32K ECB

As Jon turned to go inside, he heard something come crashing through the undergrowth just beyond the first stand of trees. Reaching for his knife, he saw a horse and rider bound into the clearing and twirl once before the mount could be brought to rein.

Mustering his courage, Jon stepped into the shaft of light emanating from the doorway. With knife drawn, he stood before the lathering steed. "Hail, fellow," he challenged. "If thee come for solace, then well met. But if thee have mischief in mind, prepare thyself."

"I seek no mischief," the rider responded in shaken tones. "Sheathe thy blade and bid welcome to a messenger of the king."

"What herald could be of such import as to bring thee through this evil forest at night?" Jon queried as he grabbed the reins and cautiously helped the rider dismount. "Does the King of Daethnon care no more for thee and thy fellows than to spend thy lives for a message?"

"Well met, indeed," replied the rider, "and well spoken. Were that I were in thy charge instead. But mine sire is not so callous. These evil times bode ill for all men, whether they ride or hide. Dangerous times warrant dangerous acts."

"Verily, thou dost echo mine own thoughts," said Jon. "Speak then thy message, herald, that I may judge its import for mineself."

Reaching into the leather pouch swung over his shoulder, the rider pulled forth a rolled parchment, tied in the center with a golden ribbon that caught the dim starlight, flashing brightly. Unrolling the document, he rose to his full stature and read: "Know ye people throughout the realm that by these presents, His Majesty, the King of Daethnon, doth hereby proclaim that whosoever slayeth the beast that dwelleth in the Forest of Wilmouth, and further, that bringeth the head of this beast before His Royal Highness, shalt be rewarded for his service to the crown the hand of the Princess Shera in marriage and one quarter of all the lands of the Kingdom of Daethnon."

Awestruck, Jon stumbled against the side of the horse before clutching the stirrup and catching his balance. It was an omen, he thought — an omen of fortune in a time where the word no longer held meaning.

"I accept this charge," he bellowed, "for surely, it doth suit my purpose. Verily, I shalt seek out this demon and send it back to the netherworld from which it was spawned."

Whirling around, Jon strode into the cabin, grabbed his pack and bow, and extinguished the tiny lamp on the table. Without a glance, he walked back through the doorway for the last time and headed for the clearing's edge.

As the morning light began filtering over the treetops from the east, the messenger called after him as he disappeared into the brush. "Well met, indeed, sire, and may we soon meet again. Know ye that the prayers of all the realm go with thee."

Loading and Playing Instructions

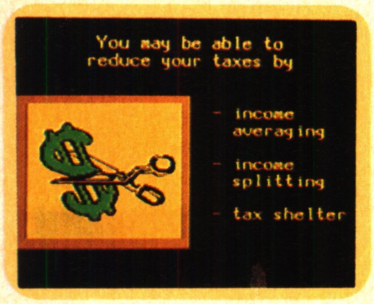
The Head of the Beast is a fairly unusual Adventure in that a joystick is used to enter all commands. Originally intended for 32K Extended BASIC, it is easily adapted to 16K ECB, with the only sacrifice being the game-save routine.

If you are entering the program from the listing into a 32K or 64K ECB machine, no changes need to be made. Simply save the game with *CSAVE "BEAST"*. Afterward, the program can be loaded with *CLOAD* and no other commands are necessary.

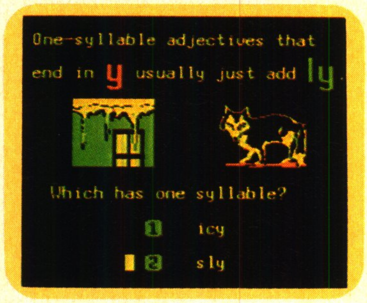
To enter the program from the listing into a 16K ECB machine, first enter *POKE25,6*. Then omit Lines 3000-3070

NEW! For Your TRS-80 Color Computer

320 Full-time Audio Talk/Tutor Programs!


You may be able to reduce your taxes by
- income averaging
- income splitting
- tax shelter

Which?
1 sister
2 smaller


One-syllable adjectives that end in y usually just add ly.
Which has one syllable?
1 icy
2 sly

We're Your Educational Software Source

Course	No. of Programs
Language Arts (Spelling)	16 Programs
Reading	64 Programs
Comprehension	32 Programs
Phonics	32 Programs
English as a Second Language	32 Programs
Mathematics	64 Programs
Basic Algebra	16 Programs
Physics	16 Programs
Effective Writing	16 Programs
History	32 Programs

In Color, with Pictures and Text!

All of our TRS-80 Color programs have easy to understand professional announcer narration, not synthesized, robotic voices. All text is displayed in easy to read upper- and lower-case characters. Video clearly illustrates key concepts in each frame of the program.

Only **$4.40** per program (**$8.80** for 2, one on each side of a half-hour cassette). **$59.90** for 16 programs (8 cassettes) in an album. Send for catalog of over 1000 programs for Atari, TRS-80, Apple, etc.

Dealer inquiries welcome
For more information, or to order call:
TOLL FREE 1-800-654-3871
IN OKLAHOMA CALL (405) 288-2301

DORSETT
Educational Systems, Inc.
Box 1226, Norman, OK 73070

MasterCard
VISA

as you type in the listing and add the following lines:

```
5 CLEAR 500
3000 RETURN
```

The program can then be saved in the usual manner. Thereafter, when loading the game, enter *POKE 25,6* before *CLOADing*.

If you subscribe to RAINBOW ON TAPE, the program can be loaded into 16K ECB by first entering *POKE 25,6* and then *CLOAD"BEAST"*. After the program has loaded, type:

```
DEL 3000-3070
3000 RETURN
5 CLEAR 500
```

The program is now modified to run in 16K of RAM and should be saved on tape before playing. As before, *POKE 25,6* must be entered each time thereafter before loading.

To play *The Head of the Beast*, you must have a joystick plugged into the right joystick port. The commands are selected by moving the cursor with the joystick until the desired command is highlighted and then pressing the fire button. When a verb is selected, the words on the screen are replaced by a group of nouns. Movement is accomplished in the same manner, with permissible directions surrounded by black bars.

If you are using the 32K version with the game-save routine, you may save your game position by moving the cursor to the word *TAPE* and pressing the joystick fire button. Then move to the word *SAVE*, press the fire button, and press the Play and Record buttons on the cassette recorder. When prompted, enter a filename of up to eight letters and hit ENTER. The game can then be loaded in the same manner, returning to the position in the game where the save was made.

You're now ready to engage The Beast. And remember, in this Adventure by Mark Nelson, a princess awaits your triumph.

— Kevin Nickols

130	12	3110	165
1002	189	3270	245
1550	230	8000	43
2510	171	19000	240
2720	94	50035	237
2950	248	END	141

The listing:

```
5 CLEAR 1500
10 CLS6:C$=CHR$(223):PRINT@104,"
head"C$"of"C$"the"C$"beast";:GOS
UB18000:PRINT@392,"(C)COPYRIGHT
1984";:PRINT@427,"MARK NELSON";
100 DIM V$(25),VR$(25),D$(44),SE
$(44),OT$(10),L$(5,5),N$(5,5),NR
$(5,5),NP(5,5),CA$(13),HY(14),HX
(14)
105 BL$=STRING$(32," "):BT=65280
:B1=126:B2=254:L=2:Z=1:CA$(1)="P
ACK":CA$(2)="BOW":CA$(3)="ARROW"
:CA=3:SL$=STRING$(32,223):LH=18:
```

Color Micro Journal
The Color Computer Monthly Magazine
$1.95 per issue Vol. 1, Issue 7 March, 1984
THIS 'N THAT
USING THE COLOR COMPUTER
COCO OS-9 First Impressions
CHECKS /BAS
OS-9 on the COLOR COMPUTER
LINKING LOADER
MICROBOOKS
OS-9 TIPS
CONVERTING CoCo BASIC TO OS-9 Basic09
COMPUTER OPERATING SYSTEMS
MYDIR An OS-9 Asmb. Lang. "Pipe" Filter
COPY M/L TAPES with this short BASIC Prog

!!! FREE !!!

Learn
HOW to USE
YOUR Color Computer

TRY ONE ON US
FREE
SAMPLE ISSUE
1-800-338 6800
MON.-FRI. 9-5 E.S.T.

Color Micro Journal™
5900 Cassandra Smith Rd.
Hixson, TN. 37343
TEL. (615) 842-4600 · TELEX 558 414 PVT BTH

Subscription Rates
12 Issues a Year

USA- $12.50 per year.
Canada & Mexico- $19.50 per year

Surface Foreign- $24.50 per year.
Airmail Foreign- $48.50 per year

TM Color Micro Journal is a trademark of Computer Publishing Inc.

The best in software for kids!

SEASON'S GREETINGS FROM STEVE, CHERYL, ADAM, DAVID, SHARI AND PRINCESS, THE CAT

MATH

THE MONEY SERIES
BY STEVE BLYN

DOLLARS & SENSE 16K ECB $14.95
Player buys familiar items using dollars and coins to practice using money correctly.

McCOCO's MENU 16K ECB $14.95
Learn to buy and add up your purchases from a typical fast-food restaurant menu.

MONEY-PAK 32K ECB $22.95
A combined and menu driven version of the above programs. Includes play money. Reviewed - Rainbow 7/83

EQUATIONS TUTOR 32K
Ed Guy **$19.95**

Elementary Algebra - A step by step tutorial for learning to solve linear equations. 3 levels of difficulty.

GRAPH-IT $14.95 16K EB.
Graph algebraic equations on a hires screen. Linear, quadratic, etc. By D. Steele

DISTANCE PROBLEMS $19.95
Moving graphics and text combines on a hi-res screen. Rate x Time = Distance in all its forms.
32K E.B.

MATH INVADERS by David Steele
16K EB. $17.95
A multi-level 'Space Invaders' type game to reinforce the 4 basic math operations (addition, subtraction, multiplication and division). Problems become more difficult as you progress. Hi-res. graphics, joystick required.
TAPE ONLY

THE MATH TUTOR SERIES 16K Ext.
These tutorials take the child through each step of the example. All programs include HELP tables, cursor and graphic aids. All allow user to create the example, or let the computer choose. Multi-level. Great teaching programs. By Ed Guy.

LONG DIVISION TUTOR	$14.95
MULTIPLICATION TUTOR	$14.95
FACTORS TUTOR	$19.95
FRACTIONS TUTOR (Addition)	$19.95
FRACTIONS TUTOR (Subtraction)	$19.95
FRACTIONS TUTOR (Multiplication)	$19.95
Any 2 FRACTIONS programs	$29.95

TRIGONOMETRY TUTOR 32K
By Ed Guy **$24.95**

A step by step tutorial for learning to compute the sides and angles of right triangles. All examples have graphic representation.

GRAPH TUTOR 32K ECB $19.95
Line, bar, pie and pictographs are demonstrated. Learn to read and use these graphs. Test mode, Hi-res graphics throughout. By Chris Phillips.

CROCODILE MATH 16K Ext.
By Art Provost **$17.95**

An animated math game using hires graphics. A fish containing a problem moves toward a crocodile containing a possible answer. If the answer is true, open the crocodile's mouth with the joystick to eat the fish. If false, keep his mouth closed. Addition, subtraction, and multiplication examples on 3 levels, 3 speeds. Tape only.

PRESCHOOL

PRESCHOOL SERIES $11.95 EA.
Pre. 1 - 2 programs for number recognition and counting.
Pre. 2 - 2 programs for simple addition, number game.
Pre. 3 - Alphabet recognition.
All 16K E.B. By J. Kolar

FIRST GAMES by Penny Bryan
32K EB. tape $24.95 disk $27.95
First Games contains 6 menu-driven programs to delight and teach your early learners (ages 3-6). These games enrich the learning of colors, numbers, lowercase letters, shapes, memory, visual discrimination and counting.

ARROW GAMES by Penny Bryan
32K EB. tape $21.95 disk $24.95
Six menu driven games for young children (ages 3-6) to teach directions. All games involve using the arrow keys. Games include LADYBUG, BUTTERFLY, ARROW MATCH, KALEIDOSCOPE, RABBIT, and DOODLE. Colorful graphics.

SOCIAL STUDIES

UNITED STATES

STATES & CAPITALS $19.95
Multiple choice quiz on a hi-res screen. 32K E.B.

EXPLORERS & SETTLERS $19.95
Hi-res screen. Multiple choice quiz on explorers and settlers of the new world. 32K

KNOW YOUR STATES $19.95 32K
Shows each state to identify on hires screen. Help command and scoring. **By J. Keeling**

THE HISTORY GAME 32K ECB $14.95
"Jeopardy" type game by James Keeling. 5 categories and 5 questions in each category. One or two player game checks your knowledge of American History. Different questions each round. Hi-res graphics.

FAMOUS AMERICAN WOMEN $19.95
A who-am-I game of over 50 multiple choice questions on a hir-res screen. 32K E.B.

LANGUAGE ARTS

(ALL PROGRAMS IN 16-K EXTENDED EXCEPT WHERE NOTED)

BEYOND WORDS 32K ECB $19.95 Each
These Language Arts programs cover common misspellings, and synonyms/-antonyms on each level. Additionally, Level 1 tests contractions and abbreviations, Level 2 tests homonyms, and Level 3 tests analogies. Each program has 3 parts and contains over 400 questions and uses over 800 words. All tests are grade appropriate. User modifiable (directions included). Printer option.

Level 1 Grades 3-5	
Level 2 Grades 6-8	
Level 3 Grades 9-12	
DISK VERSION	Each $23.95

CONTEXT CLUES - by Steve Blyn - Multiple choice reading programs. Specify grade 4,5,6 or 7. each $17.95

VOCABULARY BUILDERS - 32K - Great for test preparations. 200 questions, multiple choice, modifiable, printer option. I (grades 3-5), II (6-8) or III (9-12) each $19.95

READING AIDS 4-PAK - Child creates own reading material. $19.95

KING AUTHOR'S TALES $29.95
Student may create and save original stories on files. Question/Answer, title page picture features, too. Rewirte, review, and printer features. Includes selection of stories and pictures.
32K EB Disk or 16K EB Tape

FOREIGN LANGUAGE

FRENCH OR SPANISH BASEBALL - By S. Blyn each $11.95
Vocabulary practice. 200 words. Modifiable. Specify language.
Also in 32K (500 words) $19.95

HEBREW BULLETIN BOARD-by J.Kolar-utility to print words. $15.95

HEBREW ALPHABET - Learn the letters of this alphabet. $11.95

Learning*Leisure

TEACHER/STUDENT AIDS

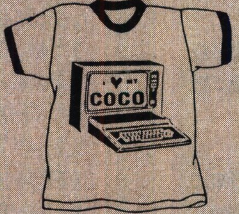
THE QUIZ MAKER by David Stanley
32K EB. tape $24.95 disk $27.95
A program that enables a teacher to create tests or a student to study for tests in any subject area. Your questions and answers may be saved for future use. Short answer, true-false, fill-in and other quiz formats are supported. Printer option for hard copy test generation. Program randomizes questions, keeps track of score and provides a variety of testing formats.

ARITHMETIC TUTOR DIAGOSTIC
FRACTIONS TUTOR DIAGNOSTIC
32K DISK $49.95 each
More of the MATH TUTOR SERIES. A diagnostic feature permits teachers to keep records of students' progress on the disk using a password. Printer option generates hard copy of progress reports. ARITHMETIC TUTOR covers multiplication, division, factoring, and order of operations. FRACTIONS TUTOR covers addition subtraction, multiplication, and division of fractions. Easy to operate. Disk only. By Ed Guy.

COLORGRADE 32K ECB $29.95
A great aid to teachers. Records and calculates grades for up to 6 classes of up to 40 students each. Uses number or letter grades, named or numerical periods and gives a weighted average. Easy to use. Full directions. DISK ONLY. By David Lengyel.

COMPUTER LITERACY
by Steve Blyn
32K E.B. $19.95
A computer literacy quiz exclusively for the Color Computer. Tests and scores from over 60 questions on a HI-RES upper and lower case screen. Reviews computer literacy and beginning programming knowledge. Ages 10 and up.

TREASURE HUNT by Art Provost
16K E.B. Tape Only $19.95
Find you way to the treasure through a maze filled with objects to collect, warriors, theives, secret passages, dark caves, hidden clues. Its all there for you to enjoy. Includes graphic illustation, animation, various levels of play for ages 6-12. Joystick required.



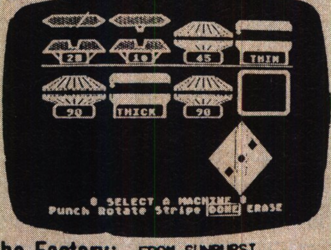
I LOVE MY COCO
TEE SHIRT
$6.95 each + $1.00 S/H per shirt
Available in Adult Sizes
S, M, L, XL, and Youth L (14-16)
White with Red Trim
and Blue Logo
TREAT YOURSELF OR A FRIEND
TO A GREAT GIFT.
CALL US FOR DETAILS
ON SCHOOL/CLUB ORDERS.

MUSIC

16K SING ALONG WITH SANTA $7.95
A SPECIAL FOR THE HOLIDAY SEASON!
A happy Santa plays and sings Christmas songs. You sing with him as the words flash across a festive Christmas tree. Choose your favorite song from the menu.

NAME THAT SONG GAMES $11.95 each
16K Extended
1. 72 children's popular songs. 2 levels of difficulty. Timer. Many hours of fun.
2. 72 all time pop, country, and movie melodies from the last three decades.
3. 60 Broadway Show tunes to test you on past musicals. Fun for all trivia buffs.

GAMES & ACTIVITIES



The Factory: FROM SUNBURST
Strategies in Problem Solving

Grades 4-adult. Winner 1983 Learning Software Award. Recommended in Classroom Computer Learning, Courseware Report Card and Electronic Learning Unique three-level program challenges students to create geometric "products" on a simulated machine assembly line which the student designs. Diskette for 32K TRS-80 Color Computer with Extended Color BASIC. $39.95

The Pond: FROM SUNBURST
Strategies in Problem Solving

Grades 2-adult. Winner 1983 Learning Software Award. Recommended in Classroom Computer Learing. A small green frog, lost in a pond of lily pads, helps students recognize and articulate patterns, generalize from raw data and think logically. Diskette for 32K TRS-80 Color Computer with Extended Color BASIC. $39.95

MR. COCOHEAD 16K E.B. $16.95
Create over 10,000 funny faces. Facial features controlled through keyboard. Surprise command. Ages 4 and up.

LIGHT PEN 16K E.B. $19.95
Enjoy this interesting piece of hardware. Control screen action with the lightpen. Includes 6 programs.

ALL PAYMENTS IN U.S. FUNDS

RAINBOW
CERTIFICATION
SEAL

Dealers inquiries invited.

Computer Island

SEASON'S GREETINGS

VISA

(718) 948-2748
Dept. R 227 Hampton Green, Staten Island, N.Y. 10312

MasterCard

Send for catalog with complete descriptions.
Please add $1.00 per order for postage. N.Y. residents, please add proper tax. FREE set of BINARY DICE, including full directions, with orders of 2 or more items
Authors: We are seeking quality children's software for leisure or learning. Write for details. Top Royalties.
TRS-80 Color Computer. TD PSystem 100.

```
VR$="light"
110 FOR X=1TO25:READ V$(X):NEXT:
GOSUB18000:FORX=1TO25:READVR$(X)
:NEXT:FORX=1TO25:READP:P$=P$+CHR
$(P):NEXT:GOSUB18000:FORY=1TO5:F
ORX=1TO5:READNP(X,Y):NEXTX,Y:FOR
X=1TO44:READD$(X):NEXT:FORX=1TO4
4:READSE$(X):NEXT:FORX=1TO10:REA
DOT$(X):NEXT
120 GOSUB18000:FORX=1TO44:READN,
S,E,W:NO$=NO$+CHR$(N):S$=S$+CHR$
(S):E$=E$+CHR$(E):W$=W$+CHR$(W):
NEXT:GOSUB18000:FORY=1TO5:FORX=1
TO5:READL$(X,Y):NEXTX,Y:GOSUB180
00:FORY=1TO5:FORX=1TO5:READN$(X,
Y):NEXTX,Y:FORY=1TO5:FORX=1TO5:R
EADNR$(X,Y):NEXTX,Y
130 C$=CHR$(128):CLS
200 GOSUB1000:GOSUB305:GOSUB9000
:GOSUB400:GOSUB9000:GOSUB15000:G
OTO200
305 GOSUB5000:PRINT@320,SL$;
310 FOR X=1TO25:PRINT @ASC(MID$(
P$,X))+300,V$(X);:NEXT:IF ASC(MI
D$(NO$,L)) THENPRINT@ASC(MID$(P$
,3))+299,C$"N"C$;
313 IF ASC(MID$(S$,L)) THENPRINT
@ASC(MID$(P$,13))+299,C$"S"C$;
315 IF ASC(MID$(E$,L)) THENPRINT
@ASC(MID$(P$,9))+299,C$"E"C$;
317 IF ASC(MID$(W$,L)) THENPRINT
@ASC(MID$(P$,7))+299,C$"W"C$;
320 PRINT@ASC(MID$(P$,LH))+300,V
R$;
350 GOSUB7000:HL=(JY-1)*5+JX:IFH
L=2ORHL=4ORHL=8ORHL=12ORHL=14ORH
L=LH THEN360ELSEPRINT@ASC(MID$(P
$,HL))+300,VR$(HL);:PRINT@ASC(MI
D$(P$,LH))+300,V$(LH);:LH=HL
360 X=PEEK(BT):IF X=B1 OR X=B2 T
HEN VR$=VR$(LH):RETURN ELSE350
400 PRINT@336-LEN(V$(LH))/2,VR$;
410 ON LH GOTO 1110,,1310,,1510,
1610,1710,,1910,2020,2110,,2310,
,2510,2610,2710,2810,2910,3000,3
110,3210,3310,3400,3510
1000 PRINT @0,"I AM ";:IFD$(L)="
C"THEN PRINT"IN A CAVE"ELSEIFD$(
L)="T"THENPRINT"ON A TRAIL"ELSE
IFD$(L)="W"THEN PRINT"ON THE WES
T SHORE"ELSE IFD$(L)="E"THEN PRI
NT"ON THE EAST SHORE"ELSE PRINTD
$(L)
1002 IFD$(L)="C"THEN1040ELSECV=0
1005 PRINT@32,"I SEE: ";:IF SE$(
L)="" THEN PRINT"NOTHING OF INTE
REST" ELSE PRINT SE$(L)
1030 PRINTSL$;:RETURN
1040 IFMA>1ORCN>2THENCV=0:GOTO10
05ELSEPRINT"IT'S TOO DARK TO SEE
.":CV=1:GOTO1030
1110 GOSUB10000:FORX=1TO10:IF N$
=OT$(X)THEN 1115 ELSE NEXT:GOTO1
2000
1115 FORX=1TOCA:IFCA$(X)=N$THENP
RINT"YOU ALREADY HAVE THE "N$:RE
TURNELSENEXT
1120 CA=CA+1:CA$(CA)=N$:PRINT N$
" TAKEN.":SE$(L)="":RETURN
1310 GOSUB5050:N=ASC(MID$(NO$,L)
):IF N THENL=N:RETURN ELSE2060
1510 GOSUB10000:PRINTL$(HX(HX),H
Y(HX)):IFN$="PACK"THEN5110ELSEIF
N$="INN"THENSE$(L)="DOOR":RETURN
ELSE IFN$="TABLE"THENSE$(L)="CAN
DLE":RETURN ELSEIFPEEK(1120)=96
THENPRINT@96,"I SEE NOTHING SPEC
IAL."
1520 RETURN
1550 PRINT@NP(X,Y),N$(X,Y);:C=C+
1:HY(C)=Y:HX(C)=X:RETURN
1610 GOSUB10000:FORX=1TOCA:IF N$
=CA$(X) THEN1620ELSENEXT
1618 PRINT"YOU DON'T HAVE THE "N
$".":RETURN
```

One-Liner Contest Winner . . .

Here's a winner that draws buildings in random sizes and colors. Just type in the program, *RUN* and watch the city lights.

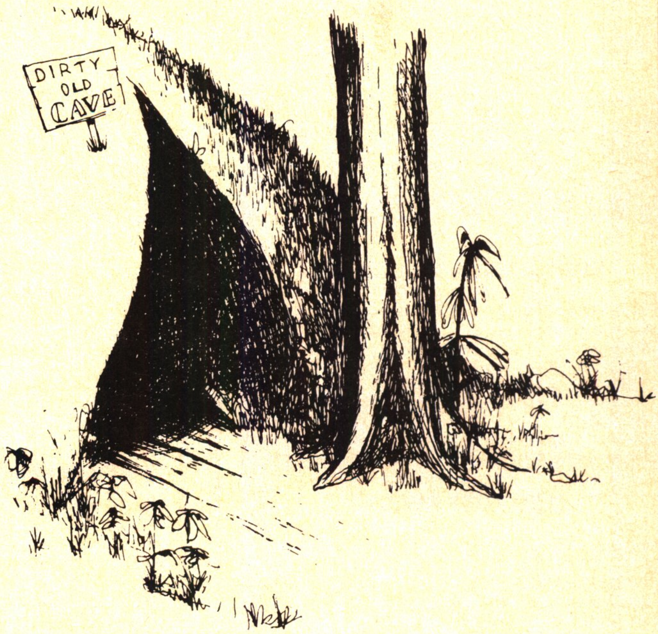
The listing:

```
1 IFZ=0THENPMODE4:PCLS:SCREEN1,1
:Z=1:DRAW"BM89,5R6L3D6BR6U6D3R4U
3D6BR4NR4U3NR3U3R4BR13NF1L2G1D4F
1R2NE1BR4R3NR3U6L2R5BR4R6L3D6BR8
U3NH3E3":GOTO1ELSEA=RND(230):B=R
ND(99)+A:C=RND(90)+RND(90)+9:D=R
ND(255):POKE178,D:LINE(A,192)-(B
,C),PSET,BF:GOTO1
```

Jeff Pickard
Houston, TX

(This one-liner contest winner will receive *The Rainbow Book Of Adventures* and its accompanying tape.)

```
1620 IFN$="PACK"THEN1640 ELSE DR
$=N$:PRINT DR$;" DROPPED.":GOSUB
6000:IF SE$(L)<>DR$ THEN PRINT"A
 THIEF SUDDENLY APPEARS AND     S
TEALS THE "N$"."
1630 RETURN
1640 DR$=N$:GOSUB6000:RETURN
1710 GOSUB5050:W=ASC(MID$(W$,L))
:IF W THENGOSUB14000 ELSE2060
1720 L=W:RETURN
1910 GOSUB5050:E=ASC(MID$(E$,L))
:IF E THENGOSUB14000 ELSE2060
1920 L=E:RETURN
2020 GOSUB10000:IF N$="INN"THEN
2030 ELSE IF N$="SHED"THEN2040 E
LSE IF N$="BOAT"THENL=13:RETURN
ELSEIFN$="CAVE"THEN 2055ELSE2060
2030 IF B=1 THEN L=16:RETURN:ELS
E11000
2040 IFL=5THENL=4:RETURNELSE2060
2055 GOSUB5050:PRINT"THE BOAT DR
IFTS AWAY.":IFL=40THENL=39
2056 RETURN
2060 PRINT"YOU CAN'T GO THERE.":
RETURN
2110 GOSUB10000:IF N$="KNIGHT"TH
EN2120 ELSE IF N$="SNAKE"THEN213
0 ELSE IFN$="BEAST"THEN 2150ELSE
12000
2120 PRINT"YOU ATTACK THE KNIGHT
. HE PUSHESYOU OFF OF THE BRIDGE
 AND YOU   FALL 1000 FEET TO YOU
R DEATH.":GOTO2155
2130 PRINT"YOU ATTACK!  THE SNAK
E BITES BE-FORE IT DIES.":S=1:SB
=3:SE$(43)="DEAD SNAKE":L$(5,5)=
"THE 'GULLET SNAKE' LIES DEAD.":
RETURN
2150 PRINT"YOU ATTACK THE BEAST!
  THE BEASTSEEMS TO BE SMILING A
S HE PICKS YOU UP AND EATS YOU A
LIVE!"
2155 PRINT@320,SL$;:GOSUB5000:PR
INT@293,"YOUR ADVENTURE IS OVER"
;
2158 JX=JOYSTK(0):IFJX>33 THENPR
INT@424,"PLAY";:PRINT@434,"quit"
;:GOTO2160
2159 PRINT@424,"play";:PRINT@434
,"QUIT";
2160 X=PEEK(BT):IFX=B1 ORX=B2 TH
EN2165ELSE2158
2165 IF JX<33 THEN RUN ELSE CLS:
END
2310 GOSUB5050:SO=ASC(MID$(S$,L)
):IF SO THENL=SO:RETURN ELSE2060
2510 IFL=3ORL=5 THEN CA=CA+1:CA$
(CA)="ROCKS"
2512 GOSUB10000:IFL=3ORL=5 THENC
A$(CA)="":CA=CA-1
2515 IFN$="ROCKS"THEN2530ELSEIFN
$="ROPE"THEN2550ELSE12000
2530 IFL=8 THENL=3 ELSEIFL=10 TH
ENL=5ELSE IFL=3 THENL=8ELSE IFL=
5 THENL=10
2540 RETURN
2550 IFRP=0THEN11000ELSEIFKN=1TH
EN2570
2560 PRINT"AS YOU CLIMB OUT ON T
HE ROPE,   THE KNIGHT GRABS HIS
SWORD AND  SLICES THE ROPE.  YOU
 FALL 1000 FEET TO YOUR DEATH.":
GOTO2155
```



```
2570 PRINT"YOU CLIMB THE ROPE OV
ER THE CAN-YON.":DR$="ROPE":GOSU
B6000:IF L=23 THEN L=22 ELSE L=2
3
2580 RETURN
2610 GOSUB19000:GOSUB13000:GOSUB
19010:IFN1$="DOOR"OR N1$="BRIDGE
"THEN 2630
2620 PRINT"THAT DOESN'T WORK.":R
ETURN
2630 IFN$="AXE"THEN2640ELSE2620
2640 IFN1$="DOOR"THEN PRINT"THE
DOOR SWINGS OPEN.":MID$(W$,L,1)=
CHR$(16):L$(2,5)="IT'S OPEN.":SE
$(L)="OPEN DOOR":RETURN
2650 PRINT"THE KNIGHT GRABS HOLD
 OF THE    BROKEN BRIDGE AS IT S
WINGS DOWN AND SMASHES AGAINST T
HE CANYON  CLIFF!  HE FALLS TO H
IS DEATH.":KN=1:SE$(L)="BROKEN B
```

ENDICOTT
COMPUTER SOFTWARE AND ACCESSORIES

PRINTERS
(SEE PRINTER INTERFACE BELOW)

SPIRIT (SAME AS MX80)	$289.00
OKIDATA 92P (160 CPS) CORRESPONDENCE QUALITY!	$435.00

★ NEW! ★ NEW! ★

ABATI LQ-20P (PARALLEL) 18 CPS-DAISY WHEEL-LETTER QUALITY	$389.00
TRACTOR FEED	$ 79.00

MONITORS
(SEE MONITOR INTERFACE BELOW)
ALL WITH NONGLARE SCREEN.

NEW PRICE *BY* AMDEK (2 YEAR WARRANTY)

COLOR 300(Composite)	$262.00
VIDEO 300(G)	$149.00
VIDEO 300(A)	$159.00
GORILLA (GREEN)	$ 99.00
GORILLA (AMBER)	$109.00

SALE! SALE! SALE!
VOLKSMODEM & CABLE
VIP TERMINAL
$105.50

NEW **PRICES**

PRINTER INTERFACE
pbh SERIAL/PARALLEL

SWITCHABLE: 300 TO 9600 BAUD.
PRINTER *AND* MODEM CONNECTIONS.
NOTHING ELSE REQUIRED.

~~$89.95~~ $59.95

PURCHASED WITH PRINTER $54.00

MONITOR INTERFACE

VIDEO PLUS (COLOR OR MONOCHROME)	$24.95
PURCHASED WITH MONITOR	$20.95
VIDEO PLUS IIM (MONOCHROME FOR COLOR II)	$26.95
PURCHASED WITH MONITOR	$21.95
VIDEO PLUS IIC (COLOR FOR COLOR II)	$39.95
PURCHASED WITH MONITOR	$31.95

NEW BLANK MEDIA **PRICES**

ELEPHANT SSSD	$19.00
ELEPHANT SSDD	$21.00
ELEPHANT DSDD	$26.00
BASF QUALIMETRIC SSDD	$23.00
BASF QUALIMETRIC DSDD	$28.00
C-10 CASSETTES (ONE DOZ.)	$ 7.50

WICO
ATARI JOYSTICK ADAPTER
$17.95

MEDIA STORAGE TAPE

TAPE CAROUSEL (HOLDS 25)	$13.00

DISKETTE

FLIP'N'FILE 10	$ 5.45
FLIP'N'FILE 25	$23.95
FLIP'N'FILE 50	$29.95
DISK BANK 5 (HOLDS 50)	$13.95

SUPER-PRO KEYBOARD
NEW *BY:* MARK DATA **PRICES**
Not For COCO II
ADAPTER REQUIRED ON
COMPUTER BOUGHT AFTER 10/82.

KEYBOARD . . . . ~~$64.95~~ $56.95 ADPT. $3.95

VOLKSMODEM
BY: ANCHOR AUTOMATION
300 BAUD, DIRECT CONNECT
MANUAL ANSWER, MANUAL DIAL
INCLUDES CABLE $69.95

WICO JOYSTICK
BIG BAT HANDLE
SPRING RETURN OR FREE FLOAT
ANALOG TYPE — PLUGS RIGHT IN!
$38.95 EACH

Look at These Discounts and Compare...Remember WE PAY SHIPPING!
SOFTWARE PRICES SHOWN ARE **20% OFF** *LIST PRICE!*

SPECTRAL ASSOCIATES

	T	D
▷ CRYSTAL CASTLES	$19.95	$22.35
▷ GALAGON	$19.95	$22.35
▷ PENGON	$19.95	$22.35
▷ COLOR PANIC	$19.95	$22.35
▷ CUBIX	$19.95	$22.35
▷ LANCER	$19.95	$22.35
▷ MS GOBBLER	$19.95	$22.35
WHIRLYBIRD RUN	$19.95	$22.35
LUNAR ROVER PATROL	$19.95	$22.35

COMPUTERWARE

	T	D
▷ MR. DIG	$22.35	$24.75
▷ JUNIOR'S REVENGE	$23.15	$25.55
RANDOM BASIC (OS-9)		$60.00
▷ COLOR BASIC COMPILER		$31.95
64K SCREEN EXPANDER (64K)	$19.95	$22.35
* THE SOURCERER (R DOS)	$27.95	$31.95
THE SOURCERER (OS-9)		$31.95
▷ MACRO ASSEMBLER & XREF (R DOS)		$39.95
MACRO ASSEMBLER & XREF (OS-9)		$39.95
▷ COLOR EDITOR	$19.95	$23.95
▷ COLOR MONITOR	$19.95	$22.35
▷ MOON HOPPER	$19.95	$22.35
BLOC HEAD (Q-BERT)	$21.55	$23.95
DOODLE BUG (LADY BUG)	$19.95	$22.35
GRAN PRIX	$17.55	$21.55

SOFT LAW
T & D INCLUDED

☐ VIP WRITER (INC. SPELLER!)	$55.95	— — —
☐ VIP SPELLER	$39.95	— — —
☐ VIP CALC	$55.95	— — —
☐ VIP TERMINAL	$39.95	— — —
☐ VIP DATA BASE	$47.95	(DISK)
☐ VIP DISK-ZAP	$39.95	(DISK)
WRITER/SPELLER-CALC-DATA BASE	$152.00	— — —
ENTIRE LIBRARY	$225.00	— — —

ELITE SOFTWARE

	T	D
☐ ELITE-WORD	$47.95	$47.95
☐ ELITE-WORD/SPEL		$59.95
☐ ELITE-SPEL		$23.95
☐ ELITE-CALC	$47.95	$47.95
☐ ELITE-FILE		$59.60
☐ ENTIRE LIBRARY (DISK)		$157.00

PROGRAMMERS INSTITUTE

	T	D
▷ COMPLETE PERSONAL ACCOUNTANT — (1,2,&3)	$59.95	$63.95

SPECIAL SALE!
30% OFF
PRICKLY-PEAR SOFTWARE

	T	D
▷ JUMBO JET	$17.45	$20.95
▷ MUSIC READER	$24.45	$27.95
* ERLAND	$17.45	$20.95
▷ TRAVELIN'TOAD	$17.45	$20.95
▷ OCKYWOKY	$17.45	$20.95
▷ ADVENTURE IN WONDERLAND	$17.45	$20.95
THE DISK MANAGER		$20.95
THE DISK MASTER		$17.45
COLORKIT (Programming Utility)	$24.45	$27.95
FLIGHT	$13.95	$17.45

COGNITEC

	T	D
☐ TELEWRITER 64	$39.95	$47.95

TOM MIX

	T	D
▷ QUIX	$19.95	$22.35
elec*TRON	$19.95	$22.35
▷ WORLDS OF FLIGHT	$23.95	$26.35
SKRAMBLE	$19.95	$22.35
▷ SR-71	$23.15	$25.55
▷ CU*BER	$22.35	$24.75
▷ BUZZARD BAIT	$22.35	$24.75
▷ AIR TRAFFIC CONTROLLER	$23.15	$25.55
▷ SPACE SHUTTLE	$23.15	$25.55
▷ THE KING	$21.55	$23.95
▷ COLOR GOLF	$14.35	— — —
TAPE TO DISK	$14.35	— — —
DISK TO TAPE	$14.35	— — —
SCREEN PRINT ROUTINE (Specify Printer)	$15.95	$17.55

ADVENTURE INTERNATIONAL

	T	D
* FIRE COPTER	$19.95	— — —
* SAIGON: THE FINAL DAYS	$19.95	— — —
* EARTHQUAKE	$19.95	— — —
* AIRLINE	$19.95	— — —
▷ SEA DRAGON	$27.95	— — —
▷ TRIAD	$27.95	— — —
▷ DISKEY (Utility To Examine And Repair Disks, Plus Computer Diagnostics.)		$39.95

B5 SOFTWARE

	T	D
MONEY	$15.95	— — —
BORROW	$15.95	— — —
CARRY	$15.95	— — —
MATH FACT	$13.55	— — —
ABC'S	$ 7.95	— — —
ALL	$64.00	— — —

NOTE: ALL SALES FINAL. NO RETURNS UNLESS DEFECTIVE. ADDITIONAL LISTINGS IN OUR FREE CATALOG — CALL OR WRITE.

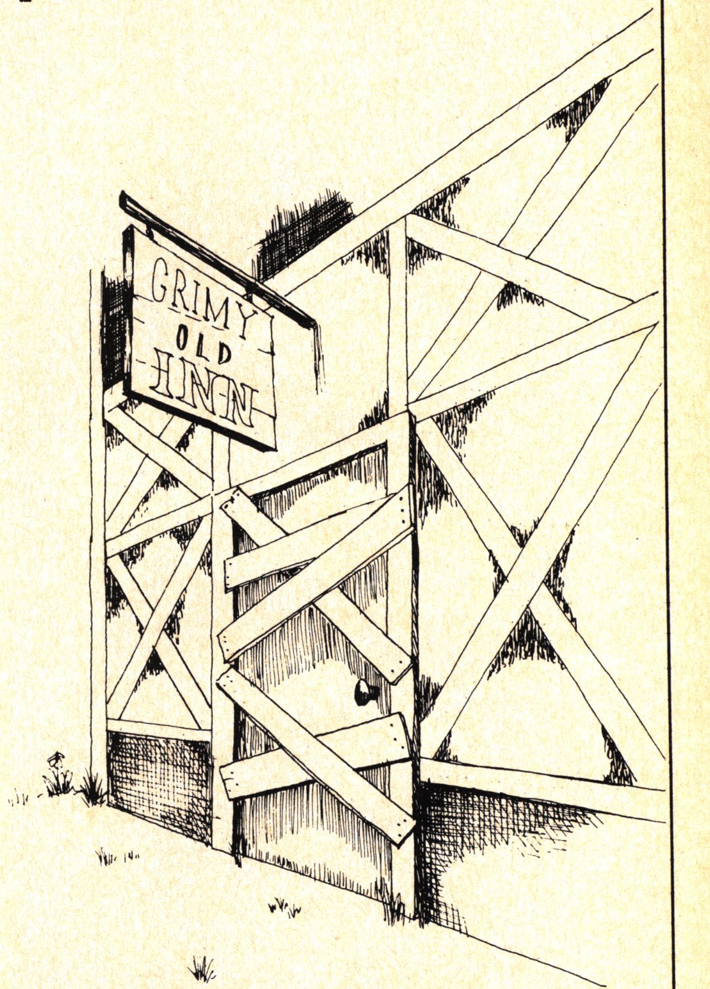
*Requires 16K Ext. Basic Minimum. ▷Requires 32K Ext. Basic Minimum. ☐We Recommend 32K or 64K. Others 16K Ext. Std. Basic Minimum.

WE PAY SHIPPING TO U.S.A., CANADA, AND MEXICO. C.O.D. ADD $2.00 (U.S.A. ONLY). ALLOW 2 WEEKS FOR CHECKS TO CLEAR. NO P.O. BOXES! MUST HAVE STREET ADDRESS. SHIPPING — OTHER COUNTRIES: ADD $2.00 EACH SOFTWARE ITEM AND EACH JOYSTICK. ADD $5.00 EACH ALL OTHER ITEMS (NO MONITORS OR PRINTERS SHIPPED OUTSIDE U.S.A.). ITEMS ARE SHIPPED AIR MAIL. PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

ENDICOTT
Computer Software And Accessories
2806-A S. MEMORIAL PARKWAY
HUNTSVILLE, ALABAMA 35801
VISIT OUR STORE
PRICES IN AD ARE MAIL ORDER ONLY.

PHONE ORDERS
205/536-4400
(PHONE OPEN 7 DAYS A WEEK)
WE PAY SHIPPING!

```
RIDGE":RETURN
2710 GOSUB10000:IF N$="ARROW" TH
EN FOR X=1TOCA:IF CA$(X)="BOW"TH
EN2770 ELSE NEXT:GOTO11000
2720 IF N$="BOW"THEN FORX=1TOCA:
IF CA$(X)="ARROW"THEN 2770 ELSE
NEXT:GOTO11000:RETURNELSE12000
2770 IF L=23 THEN 2775ELSE2780
2775 PRINT"THE ARROW WHIZZES THR
OUGH THE   AIR AND HITS A TREE O
N THE OTHERSIDE OF THE CANYON.
";:IF TI=1 THEN PRINT"THE ROPE I
SSTRETCHED ACROSS THE CANYON TIE
DTO THE ARROW.":AR=1:SE$(L)="BRI
DGE, ROPE, KNIGHT"
2777 GOTO2783
2780 PRINT"YOU HIT NOTHING."
2783 DR$="ARROW":GOSUB6000:RETUR
N
2810 GOSUB10000:IF N$="MATCH"THE
N2830 ELSE IF N$="CANDLE"THEN284
0ELSE12000
2820 IFN$="MATCH"THENPRINT"YOU C
AN'T LIGHT A MATCH TWICE.":RETUR
NELSE12000
2830 IF MA>1 THEN PRINT"THE MATC
H IS ALREADY LIT.":RETURN:ELSEIF
ML=1 THEN2820 ELSE MA=5:PRINT"TH
E MATCH IS NOW LIT.":ML=1:RETURN
2840 IF MA>1 THEN CN=50:PRINT"TH
E CANDLE IS NOW LIT.":CL=1:RETUR
N:ELSE 11000
2910 GOSUB10000:IF N$="SNAKE"THE
N2950 ELSEPRINT"YUUUUCK!":PRINT"
I REFUSE TO EAT THE "N$".":RETUR
N
2950 IF S=1 THEN PRINT"YOU FEEL
BETTER.  THE SNAKE MUSTHAVE BEEN
 AN ANTIDOTE FOR ITS   OWN VENOM
.":SB=-1:SE$(L)="":RETURN
2960 PRINT"YOU PICK UP THE SNAKE
 AND TRY TODEVOUR IT ALIVE!  THE
 SNAKE     STRIKES.  YOU FEEL DI
ZZY!  YOU  ARE DEAD.":GOTO 2155
3000 GOSUB5000:PRINT@424,"LOAD":
PRINT@434,"SAVE"
3010 JX=JOYSTK(0):IFJX>33THENPRI
NT@424,"LOAD";:PRINT@434,"save";
:GOTO3030
3020 PRINT@424,"load";:PRINT@434
,"SAVE"
3030 X=PEEK(BT):IFX=B1 ORX=B2 TH
EN3040 ELSEIFINKEY$=" "THEN200EL
SE3010
3040 GOSUB5000:IFJX>33THEN3060
3045 PRINT@334,"load";:GOSUB1600
0
3050 OPEN"I",#-1,A$:FORX=1TO44:I
NPUT#-1,SE$(X):NEXT:FORX=1TO10:I
NPUT#-1,CA$(X):NEXT:INPUT#-1,L,C
A,MA,CN,CO,B,S,CL,ML,BS,S,HT,W,L
$(2,5),SB,TI,TB,AR:CLOSE#-1:MID$
(W$,17)=CHR$(W):GOTO200
3060 PRINT@334,"save";:GOSUB1600
0
```



```
3065 OPEN"O",#-1,A$:FORX=1TO44:P
RINT#-1,SE$(X):NEXT:FORX=1TO10:P
RINT#-1,CA$(X):NEXT:PRINT#-1,L,C
A,MA,CN,CO,B,S,CL,ML,BS,S,HT,ASC
(MID$(W$,17)),L$(2,5),SB,TI,TB,A
R:CLOSE#-1:GOTO200
3110 GOSUB10000:IF N$="ROPE"THEN
3120ELSE12000
3120 PRINT@320,SL$;:PRINT@332,"t
o"CHR$(223)"what";:QU=0:GOSUB100
40:IFN$="BRIDGE"THEN3140ELSE IFN
$="ARROW"THEN3130 ELSE PRINT"YOU
 CAN'T TIE THE ROPE TO THE":PRIN
T N$".":RETURN
3130 PRINT"THE ROPE IS TIED TO T
HE ARROW.":TI=1:RETURN
3140 PRINT"THE ROPE IS TIED TO T
HE BRIDGE.":TB=1:RETURN
3210 GOSUB10000:FORX=1TO10:IF OT
```

SOFTMART
CHRISTMAS SALES

SALE PRICES GOOD UNTIL DECEMBER 26.

HARDWARE

LEGEND PRINTER 800	279.00
LEGAND PRINTER 1000	369.00
LEGEND PRINTER 1200	399.00
BOTEK PARALLEL INTERFACE — SAVE 15.00 IF ORDERED WITH ABOVE PRINTERS	69.95
GORILLA GREEN MONOCHROME MONITOR	94.95
GORILLA AMBER MONOCHROME MONITOR	101.95
VIDEO PLUS	22.45
VIDEO PLUS IIM	24.25
HJL 57 PROFESSIONAL	79.95
J&M DISK CONTROLLER	139.00
64K UPGRADE KIT	45.95
SPECTRUM LIGHT PEN	17.95
PHELAN SWITCH BOX (FOR CONNECTING PRINTER AND MODEM AT THE SAME TIME/DATA TRANSFER LIGHT)	39.95
PHELAN 10 FT EXT. CORD FOR PRINTER:	
MALE TO MALE	15.00
FEMALE TO MALE	15.00
PHELAN 10FT COCO JOYSTICK CABLE	15.00
PEEKS AND POKES CAT. FOR COCO	15.00
VIDEO CLEAR	15.95
SHUGART DUAL DISK DRIVES	350.00
WITH J&M CONTROLLER	450.00
SHUGART SINGLE DISK DRIVES	240.00
WITH J&M CONTROLLER	325.00
VIDEO IIC	35.00

SOFTWARE

CHOPPER STRIKE (MICHTRON)	25.00 (C/D)
CANDY CO. (INTRACOLOR)	30.50 (C/D)
WILLY'S WAREHOUSE (INTRACOLOR)	30.50 (C/D)
GALAGON (SPECTRAL ASSOCIATES)	21.50 (C)/25.40 (D)
TIMS MAIL (SUGAR)	17.95 (C)
TIMS (SUGAR)	20.95 (C)
QUEST 32K (AARDVARK)	21.50 (C)/26.30 (D)
NINJA WARRIOR (PROGRAMMER'S GUILD) (GET SNOWPLOW FREE)	25.50 (C)
DIETICIAN (NORTH GLENN)	19.95 (C)
MOON SHUTTLE (DATASOFT)	29.95 (C/D)
POOYAN (DATASOFT)	25.95 (C/D)
FROGGIE (SPECTRAL ASSOCIATES)	21.50 (C)/25.50 (D)
GRAPHICOM	26.95 (D)
GRAPHICOM PICTURE DISK I-V	17.25 ea. (D)
ELITE CALC	51.95 (C/D)
ELITE FILE	69.00 (D)
NEW WORLDS OF FLIGHT (TOM MIX)	27.95 (C)/30.95 (D)
WAREHOUSE MUTANTS (TOM MIX)	21.95 (C)/24.95 (D)
SALVAGE (PROPER PROGRAMS)	9.95
COCO CALIGRAPHER (SUGAR)	20.95 (C)/25.95 (D)
TUT'S TOMB (MARK DATA)	21.95 (C)/25.95 (D)
THE NORTH CAROLINA CARTOGRAPHER	24.95 (D) 32K EXT.
ANY MARK DATA GRAPHIC ADVENTURE	21.95 (C)/25.95 (D)
MAJOR ISTAR (COMPUTERWARE)	19.95 (C)/22.95 (D)
STAR TRADER (COMPUTERWARE)	19.95 (C)/22.95 (D)
SAM SLEUTH (COMPUTERWARE)	19.95 (C)/22.95 (D)
MIDDLE KINGDOM (COMPUTERWARE)	19.95 (C)/22.95 (D)
TELEWRITER-64 (COGNITEC)	45.95 (C/54.95 (D)
MR. DIG (COMPUTERWARE)	23.20 (C)/25.50 (D)
JUNIOR'S REVENGE (COMPUTERWARE)	23.50 (C)/25.50 (D)
PENGON (SPECTRAL ASSOCIATES)	19.95 (C)/23.50 (D)
VIP DISK-ZAP (SOFTLAW)	42.50 (D)
CASHMAN (MICHTRON)	22.50 (C)/24.95 (D)
TIME BANDIT (MICHTRON)	22.50 (C)/24.95 (D)
DEMON SEED (MICHTRON)	22.50 (C)/24.95 (D)
OUTHOUSE (MICHTRON)	22.50 (C)/24.95 (D)
COLOR FURY (MICHTRON)	22.50 (C)/24.95 (D)
RAINBOW SCREEN MACHINE (RAINBOW)	25.45 (C)/28.00 (D)
SUPER SCREEN MACHINE (RAINBOW)	38.20 (C)/40.40 (D)
64K DISK UTILITY (SPECTRUM PROJECTS)	18.95 (D)
HOMEBASE (WORKBASE DATA SYSTEMS)	49.95 (D)
WORKBASE I (WORKBASE DATA SYSTEMS)	61.95 (D)
WORKBASE II (WORKBASE DATA SYSTEMS)	75.00 (D)
DEJAVU (BEAR GRIP SOFTWARE)	13.95 (C)/15.95 (D)
YATCHTSEE (BEAR GRIP SOFTWARE)	16.95 (C)/17.95 (D)
MATHS - TREK	15.95 (C)
MACRO ASSEMBLER & XREF (COMPUTERWARE)	31.00 (D)
COLORBOWL FOOTBALL (COMPUTERWARE)	19.95 (C)/23.95 (D)
ICE HOCKEY (COMPUTERWARE)	19.95 (C)/23.95 (D)
GRAN PRIV (INTRACOLOR)	27.95 (C/D)
ROBOTTACK (INTRACOLOR)	19.95 (C)/22.95 (D)
BJORK BLOCKS (MORETON BAY)	29.95 (C/D)

AND MORE!!

SEND FOR OUR FREE CHRISTMAS SALES SHEET. SALES IN ALL CATAGORIES: ARCADE, ADULT, BUSINESS APPLICATION, UTILITY, FLEX, OS-9, ADVENTURE, DATABASE, LANGUAGES, SPREADSHEETS, EDUCATION, HARDWARE, BIBLE STUDY, INVESTMENT, SCIENCE/ENGINEERING, HAM RADIO, MUSIC, WORD PROCESSING, HOME, COMMUNICATION, AND BOOKS.

WE ARE ACTIVELY LOOKING FOR GOOD PROGRAMS TO DISTRIBUTE.
WRITE FOR AUTHORSHIP/DISTRIBUTORSHIP PACKAGE.

SEND FOR YOUR FREE DESCRIPTIVE CATALOG (INCLUDE $2.00 FOR SHIPPING AND HANDLING). PLEASE SPECIFY COMPUTER.

● MONTHLY SALES SHEET ● ACCEPTANCE OF CHECKS WITH NO DELAY
● RALEIGH, NC STORE LOCATION COMPLETE WITH LIBRARY AND COMPUTER DISPLAYS.

MAIL ORDERS: $2.00 - 1ST CLASS / $2.00 - UPS GROUND / $4.00 AIR
$2.00 - C.O.D. / NC SALES TAX 4½%

MC & VISA WELCOMES

SOFTMART

5024E Departure Drive - Raleigh, NC 27604

ORDER ONLY
1-800-334-0854, EXT. 879

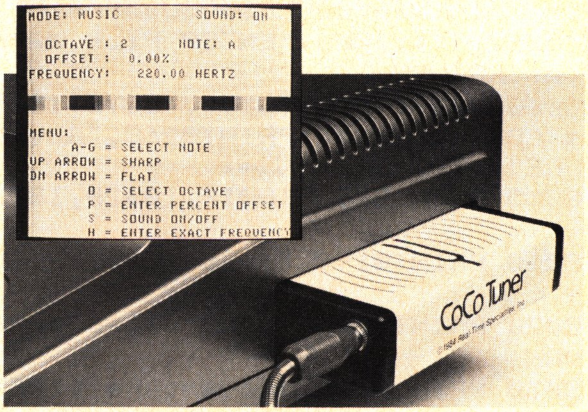
INFORMATION
(919) 876-6124

```
$(X)=N$THEN3230 ELSENEXT:GOTO120
00
3230 FOR X=1TOCA:IF CA$(X)=N$ TH
EN 3250 ELSE NEXT
3240 PRINT"YOU DON'T HAVE THE ";
N$;".":RETURN
3250 DR$=N$:GOSUB6000:IF N$="SPE
AR"THEN 3260 ELSE PRINT"YOU THRO
W THE "N$".":RETURN
3260 IF L=15 THEN 3270 ELSE PRIN
T"YOU THROW THE SPEAR.  IT FLIES
  SWIFTLY AND SMOOTHLY THROUGH T
HEAIR.":RETURN
3270 PRINT"YOU THROW THE SPEAR A
T THE BEASTWITH DEADLY ACCURACY!
  THE SPEARLODGES HIGH IN THE BE
ASTS CHEST.THE BEAST FALLS TO TH
E GROUND   NEAR DEATH!":BS=1:RET
URN
3310 GOSUB10000:IF N$="DOOR"THEN
11000ELSE IFN$="PACK"THENPRINT"T
HE PACK IS OPEN."
3330 RETURN
3400 GOSUB10000:IFN$="BOAT"ORN$=
"OAR"THEN3410ELSE12000
3410 FORX=1TOCA:IFCA$(X)="OAR"TH
EN3420ELSENEXT:GOTO11000
3420 IFLEFT$(D$(L),9)="IN A BOAT
"THEN PRINT"THE OAR SLIPS OUT OF
 YOUR HANDS AND DRIFTS DOWN RIVE
R.":DR$="OAR":GOTO6000ELSEPRINT"
YOU FEEL LIKE AN IDIOT AS YOU
START TO ROW ON DRY LAND."
3499 RETURN
3510 GOSUB13000:IFN$="SWORD"ANDN
1$="BEAST"THEN3520 ELSE2620
3520 IFBS=1THEN PRINT"YOU CUT OF
F THE HEAD OF THE      BEAST!  YO
U'VE DEFEATED HIM!":GOTO20000ELS
EPRINT"YOU LAND A BLOW WITH YOUR
 SWORD.":HT=HT+1:IFHT>3THENPRINT
"THE BEAST PICKS YOU UP AND IM-
 PALES YOU ON A STALAGTITE. OR I
S";
3530 PRINT"IT STALAGMITE?  YOU N
EVER COULD REMEMBER.":GOTO2155
5000 FORAZ=352TO448STEP32:PRINT@
AZ,BL$;:NEXT:PRINT@479,BL$;:RETU
RN
5050 FOR X=96TO288STEP32:PRINT@X
,BL$;:NEXT:PRINT@96,"";:RETURN
5110 GOSUB5050:PRINT"I HAVE IN M
Y PACK:"
5120 FOR X=2 TO CA:PRINT CA$(X),
:NEXT:PRINT:RETURN
6000 IFDR$="PACK"THENGOSUB12000:
PRINT"THE PACK IS STRAPPED ON.":
GOTO200
6005 FOR X=2TO CA:IF CA$(X)=DR$
```

```
THEN CA$(X)="":FOR A=X TO CA:CA$
(A)=CA$(A+1):NEXTA:CA$(CA)="":CA
=CA-1:IFSE$(L)=""THENSE$(L)=DR$:
RETURN
6010 NEXTX:RETURN
7000 JX=INT(JOYSTK(0)/12):JY=INT
(JOYSTK(1)/12):IF JX=0 THENJX=1
7005 IFJY=0THENJY=1
7006 RETURN
7010 LO=25:FOR X=1TOC:P=PEEK(BT)
:IFP=126 ORP=254 THEN10070 ELSEI
F INKEY$=" "THEN200 ELSE TX=ABS(
HX(X)-JX):TY=ABS(HY(X)-JY):IF TX
+TY<LO THEN LO=TX+TY:T2=X
7020 NEXT:T1=T2:RETURN
8000 PRINT@NP(HX(HX),HY(HX)),N$(
HX(HX),HY(HX));:PRINT@NP(HX(T1),
HY(T1)),NR$(HX(T1),HY(T1));:HX=T
1:RETURN
9000 X=PEEK(BT):IFX=127ORX=255TH
ENRETURNELSE9000
10000 QU=0:C=0:HX=0:GOSUB5000
10005 IFCV=1THENPRINT@96,"IT'S T
OO DARK TO "V$".":GOTO200
10010 FORX=1TO5:FORY=1TO5:FORA=1
TOCA:IFN$(X,Y)=CA$(A)THENGOSUB15
50
10020 NEXTA:IFN$(X,Y)=RIGHT$(SE$
(L),LEN(N$(X,Y))) ORN$(X,Y)=LEFT
$(SE$(L),LEN(N$(X,Y))) THENGOSUB
1550
10030 NEXT Y,X
10040 IFQU=1 THEN GOSUB5050:RETU
RN ELSEGOSUB7000:GOSUB7010
10050 IF T1=HX THEN10040ELSEGOSU
B8000
10055 GOTO 10040
10070 GOSUB5050:N$=N$(HX(HX),HY(
HX)):QU=1:RETURN
11000 PRINT"YOU CAN'T DO THAT NO
W.":RETURN
12000 PRINT"YOU CAN'T "V$(LH)" T
HE "N$".":RETURN
13000 GOSUB10000:N1$=N$:PRINT@33
1,"with"CHR$(223)"what";:QU=0:GO
SUB10040:RETURN
14000 IFL=43ANDS=0 THENPRINT"THE
 SNAKE BITES AND WON'T LET   YOU
 PASS.":SB=3:RETURN
15000 CN=CN-1:MA=MA-1:IFMA=1THEN
PRINT"YOUR MATCH WENT OUT."
15010 IFCN=1THENPRINT"YOUR CANDL
E WENT OUT."
15015 IF TB=1 AND TI=1 AND AR=1
THEN RP=1
15020 SB=SB-1:IFSB=0THENPRINT"YO
U'VE DIED FROM THE SNAKE BITE.":
GOTO2155
15030 IFL=13 THENL=19ELSE IFL=19
```

CoCo Tuner™

☐ Makes tuning musical instruments a breeze!
☐ Precise enough for concert piano tuning.
☐ Easy to use for music students and teachers.



At last, the all electronic equivalent of the Strobotuner* is now available for your CoCo. The CoCoTuner is a plug-in module for the Color Computer*. By plugging a microphone into this module (a sensitive preamp is built in) you enable the CoCoTuner to display a pitch comparison. Bands on the screen move to the right if the note is too sharp and left if it is too flat. You can adjust for a true "zero beat" to the internally generated pitch, which is accurate to within .003 Hz at middle C. This precise pitch is also available through the TV speaker so you can hear the pitch comparison as well as see it. Easy single-keystroke commands change notes for fast operation. Standard pitch is A-440. For non-standard tuning, a percentage offset factor may also be specified at your keyboard. For non-musical applications, you may even specify frequency to within .01 Hz.

The CoCoTuner needs only a reasonably good microphone with a standard ⅛" plug. If you are going to use the CoCoTuner for piano tuning, we offer a companion piano tuning kit (professional tuning wrench, 4 mutes, temperment felt, and a booklet "How to Tune Pianos Electronically")

* Strobotuner is a trademark of C.G. Conn, Limited
* Color Computer is a trademark of the Tandy Corpoation

Mail To:

Real-Time Specialties, Inc., 6384 Crane Road,
Ypsilanti, Michigan 48197

or call:
(313) 662-6671

Shipping: add 2% UPS ground, 5% air or Canada.
Sales Tax: Michigan residents add 4% Sales Tax.

☐ CCT-1 CoCoTuner module & Manual	$89
☐ CCT-2 Microphone with 6' cord	$14
☐ CCT-3 Piano Tuning Kit (wrench, mutes, felt, booklet)	$27
Shipping & Tax	☐
Total	☐

☐ VISA ☐ MASTERCARD ☐ check

Card# ____________ Exp. ____________
Name ____________
Address ____________
City ____________ State ____________ Zip ____________
Signature ____________

```
 THENL=33 ELSE IFL=33 THENL=40:G
OTO15050ELSE RETURN
15040 PRINT"YOU ARE DRIFTING.":R
ETURN
15050 IFB=0THENPRINT"YOUR BOAT H
AS HIT GROUND.":B=1
15060 RETURN
16000 PRINT@361,"READY CASSETTE"
:PRINT@393,"PRESS ANY KEY":IFINK
EY$=""THEN16000ELSEGOSUB5000:PRI
NT@352,"";:INPUT"ENTER FILE NAME
";A$:RETURN
18000 R=R+1:PRINT@199,"JOYSTICK"
C$"CONTROLLED";:PRINT@268,"ADVEN
TURE";:IFR>3 THENR=1
18005 ON R GOTO 18010,18020,1803
0
18010 PRINT@199,"joystick";:RETU
RN
18020 PRINT@208,"controlled";:RE
TURN
18030 PRINT@268,"adventure";:RET
URN
19000 IFL=23THEN CA=CA+1:CA$(CA)
="BRIDGE"
19001 RETURN
19010 IFL=23THEN CA$(CA)="":CA=C
A-1
19011 RETURN
20000 GOSUB5000:PRINT@160,"YOU B
RING THE HEAD TO PRESENT TOTHE K
ING.  THE KING SPEAKS .... 'YOU
HAVE DEFEATED THE BEAST.   YOU S
HALL MARRY THE PRINCESS    SHERA
 AND SHALL BE CALLED MY SONTO ON
E DAY BE KING.'  YOU LIVE  HAPPI
LY EVER AFTER."
20005 PRINT@39,"DEAD, HEADLESS B
EAST";
20010 PLAY"O2L2FL3B-L8B-L1B-P8L2
FL3O3CL8O2AL1B-P8L2FL3B-L8O3E-L2
E-L3DL8CO2L3B-O3L16CO2L16B-L3AL8
B-L2O3C":FORX=1TO500:NEXT
20020 FORX=1TO2:FORA=1TO1000:NEX
T:PLAY"O4L2CO3L3BL8F#L4AGFDL64CD
CDCDCDCDCDCDCDCDCDCL32O2BO3CL4DL
6O2GL16O3DL6EP8O2L8CEGO3CEGO4L2C
L3O3BL8F#L4AGFDL64CDCDCDCDCDCDCD
CDCDCDCDCDCBCL8EP8L8DL16EL2DO3L8
C":NEXT
20030 GOTO20030
50000 DATA GET,"",N,"",LOOK,DROP
,W,*,E,GO,KILL,"",S,"",CLIMB,BRE
AK,SHOOT,LIGHT,EAT,TAPE,TIE,THRO
W,OPEN,ROW,CUT
50005 DATA get,"",n,"",look,drop
```

MUL-T-SCREEN

RAINBOW CERTIFICATION SEAL

COLOR CHARACTER GENERATOR

A NEW DIMENSION IN COLOR COMPUTING

RAINBOW CERTIFICATION SEAL

- Now includes a character generator and sample graphic space game at no extra cost.
- Full 224 text and graphic characters. Underline in all PMODES. Prints vertically.
- All machine language, user transparent. Supports all BASIC, EXTENDED BASIC and DISK commands.
- Automatic loader recognizes 16K, 32K & 64K computers.
- Mix up to 5 character sizes in 4 colors all on one screen. A total of 10 sizes available from 8*4 to 42*24 or 32*32 in vertical mode.
- Use up to 4 defineable window screens of any size. Also includes horizontally scrolling (crawling) one line screens.
- Includes positive & negative screen dumps in 2 sizes for R/S, Epson & Gemini printers. (Please specify)
- Special Trace Delay can be used to debug programs one line at a time (even graphics).
- A special printer control can output characters to the screen & printer simultaneously.
- A must for all color computer owners. Once you try it you won't write another program without it.

INCENTIVE SOFTWARE
(519) 681-0133

P.O. BOX 323
STATION B
LONDON ONTARIO
CANADA N6A 4W1

P.O. BOX 7281
PORT HURON
MICHIGAN 48301
U.S.A.

MINIMUM REQUIREMENT 16K BASIC
TAPE - 24.95 US or 29.95 CDN
DISK - 27.95 US or 32.95 CDN

VISA MasterCard

Tape to Disk upgrade available for $8US or $10CDN. We pay postage within US & CANADA on orders over $20, otherwise please add $1. Other countries please add $2. Charge orders please add $1.

```
,w,*,e,go,kill,"",s,"",climb,bre
ak,shoot,light,eat,tape,tie,thro
w,open,row,cut
50020 DATA 53,59,67,71,77,85,95,
99,103,109,117,123,131,135,141,1
49,155,161,167,173,181,187,193,1
99,205
50025 DATA 352,359,365,371,377,3
84,391,397,403,409,416,423,429,4
35,441,448,455,461,467,473,480,4
87,493,499,505
50030 DATA IN A FOREST,T,AT THE
TOP OF THE FALLS,IN AN OLD STORA
GE SHED,AT THE TOP OF THE FALLS,
IN A FOREST,T,AT THE FOOT OF THE
 FALLS,"",AT THE FOOT OF THE FAL
LS,T,W,IN A BOAT ON A RIVER
50032 DATA E,C,IN A SMALL INN,EA
ST OF AN INN,W,IN A BOAT ON A RI
VER
50035 DATA E,C,IN A DARK FOREST,
ON A BRIDGE OVER A CANYON,T,T,W,
ON A BRIDGE,E,C,IN A DARK FOREST
,IN THE MOUTH OF A CAVE
50040 DATA  C,IN A BOAT IN A CAN
YON,C,C,C,C,C,IN THE MOUTH OF A
CAVE,IN A BOAT ON A LAKE,C,C,C,C
50050 DATA MATCH,"",SWORD,AXE,SH
ED,"","",ROCKS,"",ROCKS,"",OAR,B
OAT,BOAT,THE BEAST,TABLE,INN,RIV
ER,BOAT,RIVER,"","",BRIDGE AND K
NIGHT
50060 DATA "",ROPE,BRIDGE,"",BRI
DGE,"",SHIELD,"","",BOAT,"","","
","","","",CAVE,"","",SNAKE,SPEA
R
50070 DATA MATCH,SHIELD,ROPE,OAR
,CANDLE,AXE,SPEAR,BOW,ARROW,SWOR
D
50080 DATA ,6,,,,7,,,,,,,,,5,,,,
,,1,,7,,2,11,,6,,12,,,,,,,,14,,,
7,17,12,,8,18,,11,,,,,10,20,,,,2
1,,,,,17,,11,25,,,12,26,,,,,,,14
,28,,,15,29,,,,30,,,,,24,,,31,,2
3,17,,,,18,,27,,,,28,26,20,,,27,
21,34,,,22,35,,,24,,32,,,38,,31,
0
50090 DATA 0,,,29,,35,,30,,36,34
,,,,35,,,38,,32,43,39,37,,,,38,,
,,,34,,,,,,43,,38,,44,42,,,,43
50100 DATA "","","",IT'S VERY ST
RAIGHT AND SHARP,SALIVA DRIPS OU
T OF ITS MOUTH   AND DOWN ITS CH
IN AS IF IT SEES A DELICIOUS MEA
L!
50110 DATA "",IT'S A SMALL ONE M
AN BOAT,"",THEY LEAD UP TO THE T
OP OF THE  FALLS,THE ENTRANCE LE
ADS INTO DARKNESS,"","",IT'S VER
Y HEAVY AND STRONG BUT  DULL
50120 DATA "","","","",IT'S A FI
NELY CRAFTED SPEAR      DESIGNED
FOR HUNTING
50130 DATA ON THE TABLE IS A CAN
DLE,THERE IS A DOOR.,HE WON'T LE
T YOU GET ACROSS THE BRIDGE.  HE
 LOOKS SEVEN FEET    TALL IN HIS
 FULL ARMOR.,THE DOOR IS BOLTED
SHUT. A SIGN ON THE DOOR READS '
CONDEMNED BY ORDER OF THE KING'
50135 DATA IT IS THE BOW YOUR FA
THER GAVE  YOU WHEN YOU WERE A Y
OUNG MAN.  YOU FONDLY REMEMBER H
UNTING     TRIPS IN WILMOUTH FOR
EST.,""
50136 DATA IT IS THE RARE 'GULLE
T SNAKE'
50140 DATA SHIELD,ROPE,MATCH,ARR
OW,BEAST,CANDLE,BOAT,OAR,ROCKS,C
AVE,BRIDGE,PACK,AXE,RIVER,SWORD,
!,SHED,SPEAR,TABLE,INN,KNIGHT,DO
OR,BOW,TRACK,SNAKE
50150 DATA shield,rope,match,arr
ow,beast,candle,boat,oar,rocks,c
ave,bridge,pack,axe,river,sword,
!,shed,spear,table,inn,knight,do
or,bow,track,snake
```

BASEBALL FANS !!

COLOR-STAT STRATEGY BASEBALL GAME

32 K DISK
EXT BASIC
COLOR COMPUTER

27.95
& 2.50 postage and handling

Replay Any Season

YOU ARE THE MANAGER

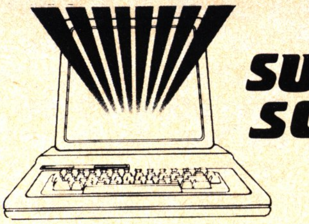
BRETT & DAWSON   AARON & PALMER

-- YOU SET THE TEAMS --
- SOLITAIRE OR HEAD TO HEAD -

SEND CHECK OR MONEY ORDER

TO: PINTO PRODUCTS
718 Fiii Circle
Santa Ana, CA 92704

GREAT COCO PRODUCTS



SUPER SCREEN

The Color Computer Supercharger

- A big 52 character by 24 line screen
- 'PRINT @' is fully implemented on the big screen
- Easily combine text with Hi-res graphics
- Auto-key repeat for greater keyboard convenience
- The 'ON ERROR GOTO' statement is fully implemented
- Control codes for additional function

Super Screen comes with complete, well detailed instructions and is available on cassette or disc. It adjusts automatically to any 16K or greater, Extended or Disc basic Color Computer or TDP-100 and uses only 2K of memory in addition to the screen memory reserved during power up. Guaranteed to be the most frequently used program in your software library...once you use it, you won't be without it!

Hot CoCo, Jan. '84 *"Super Screen represents a quality utility program that fills a definite need for the serious CoCo user. No other programs on the market so far have offered the error-trapping utility of Super Screen."*
Color Computer Magazine, May '84 *"Super Screen is a worthy addition to anyone's software library. It has become my most used utility and has made programming in BASIC on the Color Computer a joy..."*

Cassette $29.95 **Disc $32.95**

NEW!

EASY-FILE

Data Management System

- Need a good mailing list or customer list program? How about a program to keep track of your investments, your computer magazines, or record collection? Do you have an inventory of all household items for insurance purposes? **EASY-FILE** will do all of these things and many more.
- **EASY-FILE** makes data managing a breeze with single key menu selections, extensive error handling procedures, a demonstration data file and a detailed, easy to understand instruction manual.
- **EASY-FILE** is powerful too. It automatically enhances your monitor screen to a full upper and lower case 51 character by 24 line display. **EASY-FILE** allows up to 30 data fields and provides password file protection, selectable numeric totalling, and complete data searching and editing capabilities. You can quickly enter, locate, review and modify data records, and even transfer records from one file to another.
- Sorting? You bet! **EASY-FILE** allows you to sort up to 5 levels of data and allows you to define upper and lower limits as well. You can sort in many different ways and save the results in individual index files. These index files may be used later to determine what will appear on your printed reports.
- Reports are easily prepared with **EASY-FILE** because it offers so many automatic features. There is no need to generate complex report forms. With **EASY-FILE** you simply select from a list of options to determine what your report and header will look like. There are countless variations. **EASY-FILE** takes care of tab stops and field spacing automatically. Prepare horizontal reports (80 or 132 columns), vertical reports or labels! Save your favorite report formats right in a data file so they may be used whenever you need them.
- The **EASY-FILE** master disc and instructions are packaged in an attractive 3-ring binder. Requires 32K and at least one disc drive.

Order yours now! Get organized for only $59.95!

NEW!

UNIVERSAL VIDEO DRIVER

Carefully engineered to work with **ALL** Color Computer models, including the new
COCO II
ENABLES YOUR COCO TO OPERATE WITH A VIDEO MONITOR INSTEAD OF A TELEVISION

- Works with Monochrome Monitors!
- Works with Color Monitors!
- Audio Connection Included!
- Easy Installation—No Soldering!
- Great Price! **ONLY $29.95**

ORDER ENTRY SYSTEM

Rainbow, Feb. '84 *"If you are looking for a program to keep track of your sales and print invoices, then this one will take care of those needs quite well...A good program that would serve the invoicing needs of a small company quite nicely."*

The Mark Data Products sales order processing system provides a fast, efficient means to enter orders, print shipping papers and invoices, prepare sales reports, and monitor receivables. The system automatically enhances the monitor screen to a 51 character by 24 line display. 32K of memory is required along with an 80-column printer and one or more disc drives.

The MDP Order Entry System is a family of programs which operate interactively by means of a "menu" selection scheme. Up to 900 products may be defined and a single disc system can hold over 600 transactions. When the operator selects a task to be performed, the computer loads a program designed to handle that task from the system disc. The system disc contains all of the programs required to create, update and maintain data files and prepare the necessary paperwork including shipping and invoice forms, daily sales reports, a monthly (or other period) sales report and a receivables report.

This order entry software equals or exceeds higher priced packages for other computers and includes a detailed operating manual. **ONLY $99.95**

SUPER PRO KEYBOARD

ONLY $64.95*

- Original key layout
- Fast, easy installation—no soldering
- Individually boxed with full instructions
- Smooth "Touch Typist" feel—no sagging
- U.S. made—high quality, quad gold contacts
- Professional, low profile, finished appearance

* Computers produced after approximately October 1982 require an additional keyboard plug adapter. Please add $4.95.

ACCOUNTING SYSTEM

Rainbow, May '84 *"Considering what it can do to organize a small business, it is quite a value."*

Hot CoCo, June '84 *"...a serious, professional accounting program and well worth its price. The programs are complete and simple to use."*

The Mark Data Products Accounting System is ideal for the small businessman needing a fast, efficient means to process income and expenses, prepare detailed reports and maintain most of the information required at tax time. The system is a family of programs which operate by means of a "menu" selection scheme. When the operator selects a task to perform, the computer loads a program designed to handle that task from the system disc. The system disc contains all of the programs required to create, update and maintain data files and prepare the necessary accounting reports including a transaction journal, a P & L or income report, an interim or trial balance and a balance sheet.

Up to 255 separate accounts may be defined and a single disc system can hold over 1,400 transactions. This system automatically enhances the monitor screen to a 51 character by 24 line display. 32K of memory is required along with an 80-column printer and one or more disc drives.

This accounting software equals or exceeds higher priced packages for other computers and includes a detailed operating manual. **ONLY $99.95**

FREE - Send for our NEW 24 page catalog!

MD

Mark Data Products

24001 ALICIA PKWY., NO. 207 • MISSION VIEJO, CA 92691 • (714) 768-1551

SHIPPING: All orders under $100 please add $2 regular, $5 air. All orders over $100 please add 2% regular, 5% air. California residents please add 6% sales tax. Orders outside the continental U.S., check with us for shipping amount; please remit U.S. funds. Software authors—contact us for exciting program marketing details. We accept MasterCard and VISA. Distributed in Canada by Kelly Software.

$$ SAVE MONEY ON YOUR $$ CASSETTE & DISC SUPPLIES

CASSETTES

We buy cassettes and discs in large quantities for our own use and can pass the savings on to you.

C-10 Cassettes w/labels	.59 ea	10 for $5.50
Cassette storage box	.25 ea	10 for 2.00

5¼ DISCS

High quality nationally advertised brand. *Guaranteed Performance!* We will replace any disc that fails during normal use. Discs are single sided, double density, reinforced hub with Tyvek sleeve. $2.25 each 10 for $19.95

ROMS

Basic 1.2	$39.95
Extended 1.1 w/manual	49.95
Disc 1.1	39.95

NEED MORE MEMORY?

64K Memory Expansion Kit

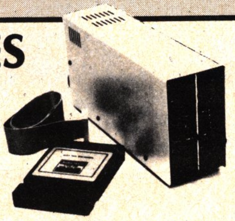
All parts and complete instructions (For 'E' and 'F' boards and CoCo II)

$59.95

COCO DISC DRIVES

COMPLETE SYSTEMS INCLUDE:

- Hi-Quality Teac Thin Line Drives
- Attractive, Beige Dual Drive Cabinet/Power Supply
- Fill Panel for Single Drive Disc Systems
- Radio Shack or J & M Controller
- Cable and Operating Manual
- Full 90 Day Warranty



Single Drive (SSDD) in Dual Cabinet w/Controller	349.95
Additional Drive	114.95
Two Drives (SSDD) in Dual Cabinet w/Controller	459.95
Single Drive (DSDD) in Dual Cabinet w/Controller	439.95
Additional Drive	199.95
Two Drives (DSDD) in Dual Cabinet w/Controller	629.95
Dual Cabinet/Power Supply	79.95
Disc Controller (Radio Shack or J & M)	139.95
Connecting Cable	24.95
Radio Shack DOS ROM 1.1	39.95

VIP SOFTWARE

We carry the most asked for softlaw products for your convenience.

VIP Writer	$69.95
VIP Terminal	49.95
VIP Calc	69.95

NEW! SUPER BUG

Mark Data Products **SUPER BUG** is a powerful, relocatable machine code monitor program for your CoCo. If you are a beginner, the program and documentation are an indispensable training aid, helping you to gain a better understanding of your Color Computer and machine code programming. If you are an accomplished computerist, **SUPER BUG**'s capabilities, versatility and convenience will prove invaluable during programming and debugging.

SUPER BUG offers so many outstanding features that we are unable to list them all in this limited space, but here are a few: hex and alpha numeric memory display, modify, search, and test; full printer support with baud rate and line feed select; up to 220 breakpoints; mini object code disassembler; 64K mode setup; decimal, hex and asci code conversion routines and extensive documentation.

Tape $29.95 **Disc $32.95**

INFORMATIVE BOOKS

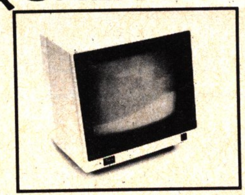
"Your Color Computer" by Doug Mosher

Over 300 pages of detailed information...an indispensable introduction to your Color Computer, complete with diagrams, photographs, and a BASIC thesaurus and command reference section. A CoCo encyclopedia. **$16.95**

"Programming the 6809" by Rodney Zaks

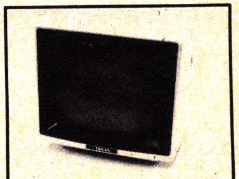
One of the best machine language texts available — required reference material. This book explains how to program the 6809 in machine language, covering all aspects progressively and systematically. **$15.95**

QUALITY VIDEO MONITORS



SAKATA COLOR SC-100 - $289.95

The SC-100 is a streamlined 13" composite monitor which produces sharp, brilliant colors. The cabinet is made of durable styrene and is available in an attractive off-white color. Includes audio with speaker and earphone jack. We highly recommend this color monitor because of its excellent performance and beautiful styling.

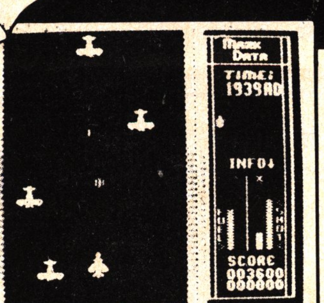


TAXAN AMBER SCREEN - $139.95

A 12" amber screen composite monitor of the highest quality with exceptional reliability and performance. 18 MHZ bandwidth. Attractive off-white cabinet. We use this monitor in our offices.

SPECIAL: Order one of these quality monitors from MDP and get our Universal Video Driver for just **$24.95!**

SUPER NEW GAMES!



NEW!

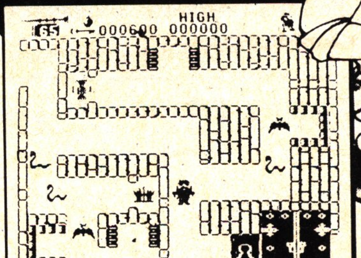
TIME FIGHTER

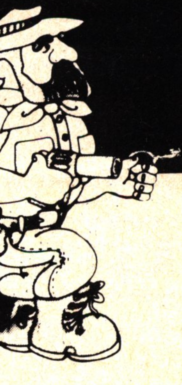
Pilot your MD-64 fighter through a hazardous time tunnel. Your mission is to destroy the dreaded Time Guardian who threatens the natural order of the universe. In order to reach this menace you must fight aerial dangers from strange and different time zones. If you like fast action, this one's for you! 16K required.

Rainbow, March '84 *"One of the best in your library of computer games. It's a real gem."*

CASSETTE $24.95

DISC $27.95





NEW!

TUT'S TOMB

Explore the ancient, mystical tomb of the great Pharoah. Find the magical keys which lead you to unbelievable treasures as you out-maneuver the creatures that slither and swarm about you. Super fast arcade action—this one will knock your socks off with 16 screens of incredible color and sound. Fabulous! 32K required.

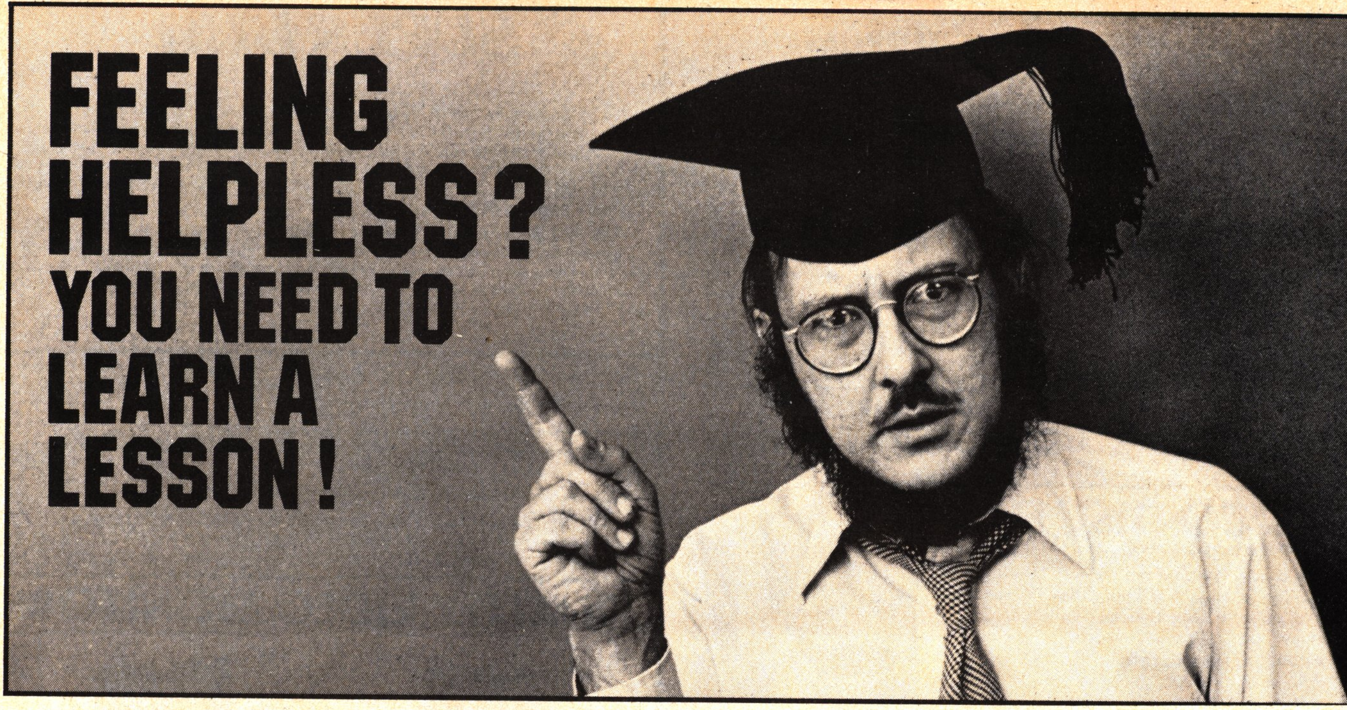
Hot CoCo, April '84 *"State of the art CoCo graphics. A first rate game."*

CASSETTE $24.95

DISC $27.95

Mark Data Products

SHIPPING: All orders under $100 please add $2 regular, $5 air. All orders over $100 please add 2% regular, 5% air. California residents please add 6% sales tax. Orders outside the continental U.S., check with us for shipping amount; please remit U.S. funds. Software authors—contact us for exciting program marketing details. We accept MasterCard and VISA. Distributed in Canada by Kelly Software.



FEELING HELPLESS? YOU NEED TO LEARN A LESSON!

MICRO LANGUAGE LAB: LEARNING THE 6809

Feeling at the mercy of a programmer somewhere? Mystified by a machine? My **Micro Language Lab** will give you the power to end those helpless feelings.

Here's why. The heart of *any* computer program *anywhere* is machine language. Every piece of software uses it — your favorite game, spreadsheet, word processor, data base manager, or recipe file. Every time you hit "Enter", it's working. All the languages and operating systems are created from it. Basic, Fortran, Pascal, Flex, OS-9, TRSDOS... they're 6809 machine language, the whole lot!

And you can learn the language of the 6809, the programming heart of your Color Computer, with my **Micro Language Lab.**

Not everyone can program. Writing a few lines in Basic now and then doesn't make you a programmer. But if you *can* program, then my **Micro Language Lab** will teach you — the right stuff, the right way.

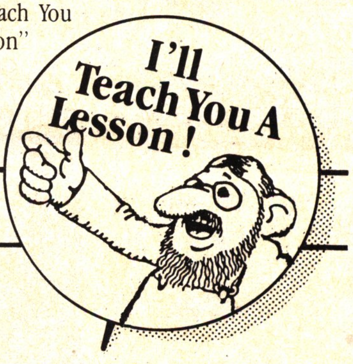
I'll teach you in 24 half-hour lessons on 12 audio cassettes, with a 220-page textbook, with data booklets, with 35 sample programs, and with a programming reference card. You'll spend 50 hours or more with my course, listening, watching, and working. And when you're done, you'll be programming your Color Computer in the 6809's language.

Stop ignoring those gnawing feelings of helplessness. The 6809 is where the power lies in your computer. Turn on that power with the **Micro Language Lab.**

- **Micro Language Lab,** $99.00 (plus $3.50 shipping and handling)

Requires 16K Extended Basic EDTASM +

Not sure? Write or call for a Table of Contents and sample pages — and your "I'll Teach You A Lesson" button!


I'll Teach You A Lesson!

ALSO AVAILABLE FROM GREEN MOUNTAIN MICRO

(Add $2.50 shipping and handling to your order)

Lowerkit III

- Full-time upper and lowercase installs in 15 minutes.
- Normal and reverse video standard
- Fully compatible with all Alpha and Graphic modes

$79.95 assembled and tested
$49.95 complete kit of parts
Important! Specify Color Computer or Color Computer II

TV Buff II, clear image for video monitors, $19.95 (specify CoCo or CoCo2)

CoCoPort parallel interface (now includes plastic case), $54.95 / $44.95 kit

ColorPack ROM/RAM pack, $29.95 (specify configuration) / $19.95 kit / case $3.00 extra

64K memory upgrade kit with full instructions, $49.95 / with memory test on tape, $54.95

Color Quaver Software Music Synthesizer on tape (requires 32/64K), $19.95

Color Burner EPROM Programmer (2716/32/32A/64/64A/128, 68764/66) with software, $69.95 / $56.95 kit

User Group, Educational, Club and Dealer Discounts are available.

TRS-80 and TRSDOS are trademarks of Tandy Corporation. Flex is a trademark of TSC, Inc. OS-9 is a trademark of Microware Corporation.

Green Mountain Micro
Bathory Road, Box R
Roxbury, Vermont 05669
802 485-6112

Hours: 9am - 5pm EST, Monday - Friday
COD/VISA/MASTERCARD

Just as we promised, now it's time for . . .

Football Fever

Part 2

By Fred B. Scerbo
Rainbow Contributing Editor

(Editors Note: If you have an idea for the "Wishing Well," submit it to Fred c/o THE RAINBOW. *Remember, keep your ideas specific, but don't forget that this is* BASIC. *All programs resulting from your wishes are for your use but remain the property of the author.)*

Here we are one full month later, and by now, I hope most of you have been able to figure out my new method of generating additional colors for your *PMODE 4* screens. I know it was cruel to keep you waiting for another month to get the technique fully explained but as I mentioned last month, a careful examination of the TV screen should have been able to give you an idea as to how this works. Shortly, I will put together a set of these routines which you can use in your own programs with the greatest of ease. That will come in an upcoming "Wishing Well."

If you typed in last month's "Wishing Well," you have already gotten some of the same type of graphics which appeared in *Rockfest* and *Baseball Fever*. As I have mentioned over and over again in these pages, I know of no greater way to learn programming, especially color graphics in Extended Color BASIC, than to key in programs such as these. This can be especially valuable and personally rewarding to high school and middle school students to get these kinds of graphics results. This can provide a spark of motivation for these young programmers to create their own works of art on the computer screen.

(Fred Scerbo is a special needs instructor for the North Adams Public Schools. He holds a master's in education and published some of the first software available for the Color Computer through his software firm, Illustrated Memory Banks.)

Since last month we had only the National Football Conference teams in part one, this month's version deals with all the American Football Conference teams. To be perfectly honest with you, these were much easier to create than last month's. (The most difficult this time around were New England and Los Angeles.) Another thing that made this version a little easier was that I could use about 25 percent of part one in part two, such as the coloring routines, the helmet shells, and the screen quiz and character sets.

If, when typing in this program, you wish to use some of the lines from the first part, you may use the following line sections without any changes:

Lines 30-130
Lines 160-210
Lines 250-300
Lines 5000-5340
Lines 5360-5670

If you delete all lines but these, and insert the newer lines as needed, you will save some time. The other lines, while they may look similar, really have to be keyed in by hand. (Better yet, RAINBOW ON TAPE is really valuable in a case like this.)

Most of the routines for painting and drawing the helmet shells remain the same in concept; I have done a little tinkering in a few cases. Take, for instance, the use of the *POKE178,n* which gives us some additional colors in a striped pattern. I only used this *POKE* once in both programs to generate green. It seems that green has been the one color which I have had the most difficulty with in *PMODE 4*. You might wonder why in these cases I just didn't draw these helmets in *PMODE3*. Normally, I would, as I did with the symbol for the Brewers in *Baseball Fever*. However, since these programs incorporate the screen quiz which really needs the *PMODE4* resolution for the screen text characters, the use of *PMODE3* would make some of these Hi-Res characters unreadable.

To compensate for this, I slightly modified Lines 140 and 150 in Part 2 to include a variable ZZ which would be included in the *POKE178* variable. Since I have allowed you to assign the red-blue values from the keyboard instead of hitting the Reset key, the *POKE178* is

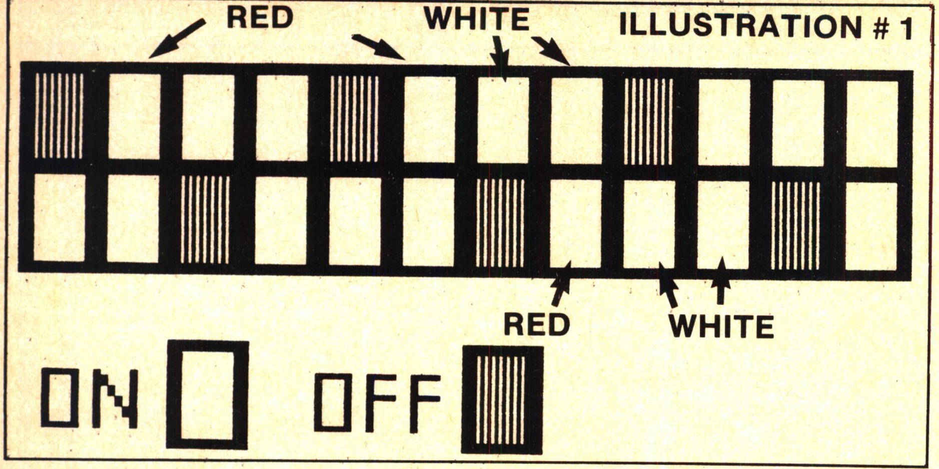


ILLUSTRATION # 1

not as easily controlled by this change from the keyboard. Thus, the use of the ZZ variable has allowed me to get much closer when the alternate red-blue assignments are chosen. (This was not exactly the case in Part 1 when painting the green for the Eagles, whose helmet might sometimes come out more on the gray side.) Hopefully, this adjustment will solve that problem for you.

Keep in mind that the colors for these helmets will not be exactly as you see them in real life or in the pages of *Sports Illustrated*. However, in most cases they will be close enough for you to identify who the teams are and impress your friends with another CoCo graphics achievement.

The Big Secret

Now let's get down to the part you've all been waiting for. How are we getting these extra colors?

A close examination of the screen will show you that most of these colors are being generated in a checkerboard style fashion. We actually get down to setting individual pixels using a counting loop. As you are by now aware, when we get red or blue in *PMODE 4*, it is because we have a case of alternate pixels being turned on and off. Therefore, a row of pixels set in the pattern of ON/OFF /ON/OFF/ON/OFF would actually give us what appears to be a solid field or line of either red or blue. If we set two adjacent pixels as ON/ON, the result will be a solid double pixel of white. Two adjoining pixels set OFF/OFF will result in a double solid pixel of black.

Take a look at Figure 1. This is the pixel pattern which I have set to simulate the color yellow, assuming we know the result of a given pixel in red or blue. (This pattern, offset by one pixel, will create a light blue pattern.) The pattern we create with the pixels results in sequences of OFF/ON/ON/ON. The visual result is to have a black pixel, a red pixel and two white pixels. The row below is set in the same fashion offset by two pixels giving us our checkerboard pattern. Therefore, the result of red sitting next to white is to give us a visual yellow in our checkerboard pattern.

Let's try another color. We know we can easily generate either red or blue. If you were using real paint and only had red and blue, how would you go about getting the color purple? Naturally, you would mix the red and blue to create the purple. Why not do the same with our screen to get purple? Check Figure 2. By setting rows of red pixels with a row of blue pixels below, our screen result will give us a purple hue, in a semi-checkerboard pattern.

While the actual pixel grid shown in Figure 2 will result in a very light purple, the actual version in the program uses half as many red pixels (every fourth instead of every other pixel turned on). Still, the illustration serves our purpose.

A check of the arrays will indicate that patterns have also been generated for a silver and gold as well. The silver alternates white pixel blocks and later combines with a blue array to give us our shades of silver or silver-blue. The gold is achieved much like the yellow only half as many red pixels are used. Depending on how your set is adjusted, the gold may appear more like orange.

Once we have generated these color strips which are two pixels deep, they are stored in an array by using the *GET* command. (The graphics screen is turned off while this occurs so we don't have to watch the strips being drawn. If you would like to see the strips being drawn, change the *SCREEN* command in Line 170 to *SCREEN1,1*. Be sure to change it back for your final copy.)

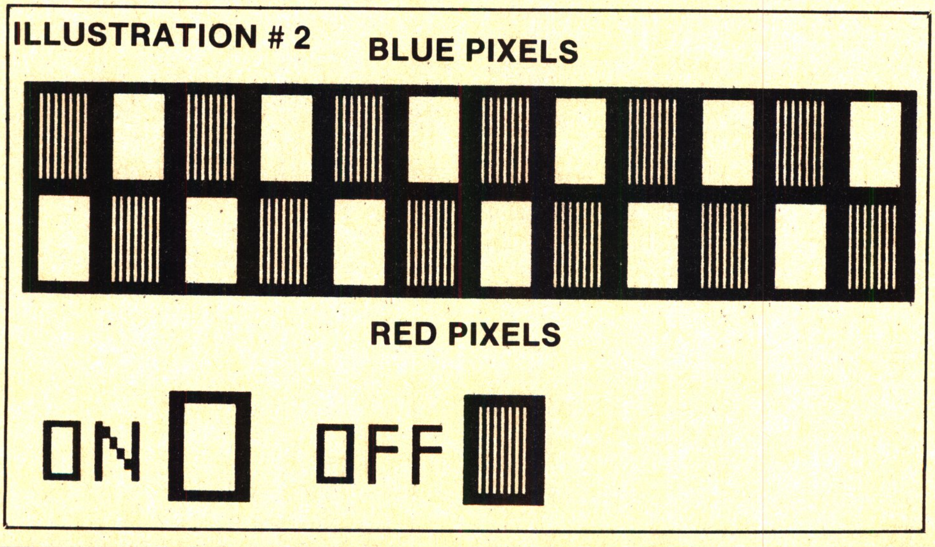
Once we have the strips stored in their arrays, we can paint them back on the screen using the *PUT* command. Since our strip is only two pixels deep, by using a *FOR. . . NEXT* loop, we can fill any part of the screen by setting up a loop to cover those coordinates.

One small problem exists, however. If we use the *PUT* command as most programmers are accustomed to using it, the strips will simply mask out any area we have drawn on our screen. This can be solved by using the *OR* command with *PUT*, rather than *PSET* or *PRESET*. The way in which *OR* works is that if a pixel is not turned on (i.e., black), then the contets of our *Get* array will appear wherever the pixels are turned off. If a pixel is turned on, that area will remain as it presently is.

Therefore, if we wish to paint an area yellow, we should first draw out the area we wish to appear as yellow and paint it black. Then, by using the *FOR . . . NEXT* loops and the *PUT* command, we will fill in only that black area with our yellow array.

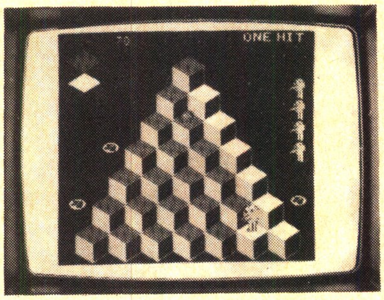
There are a few limitations, however.

ILLUSTRATION # 2



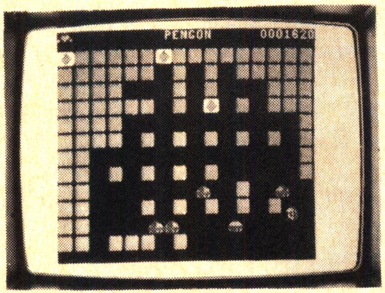
GUARANTEED QUALITY

SPECTRAL ASSOCIATES HAS PRODUCED THE HIGHEST QUALITY COLOR COMPUTER ARCADE GAMES FOR MORE THAN THREE YEARS. RADIO SHACK HAS LICENSED MANY OF OUR GAMES — HOW MANY OTHER ALLEGED "ARCADE GAME MANUFACTURERS" CAN SAY THAT? SPECTRAL IS THE STANDARD OF EXCELLENCE AND WE STAND BEHIND OUR PRODUCT. IF YOU ARE NOT 100% SATISFIED BY OUR ARCADE GAMES, RETURN THE GAME WITHIN 10 DAYS FOR A FULL REFUND.

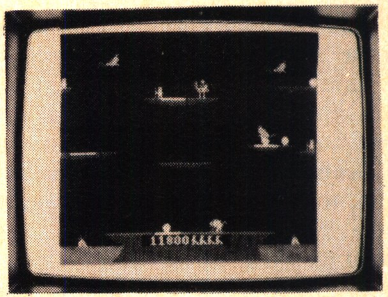


CUBIX (Q*bert)
Sixteen skill levels make this 3-D pyramid game fun for any one! Sprink the snake is just one of the creatures to look out for. Requires 32K and joysticks. Cassette $24.95. Disk $27.95.

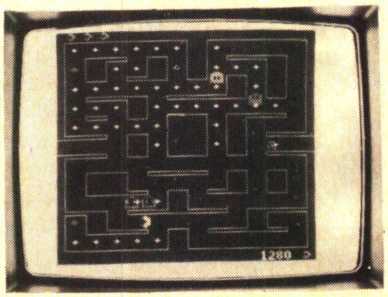
NOW TALKS!



PENGON (Pengo)
You are lost in a maze of slippery ice cubes, being pursued by 5 ice goblins. Line up the three power cubes for a quick escape. Requires 16K and joysticks. Cassette $24.95. Disk $27.95.

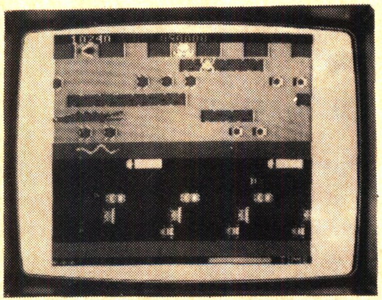


LANCER (Joust)
Lava pits, dragons & disappearing islands are just a few of the obstacles you must overcome. Then the awesome Dragon appears. Requires 32K and joysticks. Cassette $24.95. Disk $27.95.



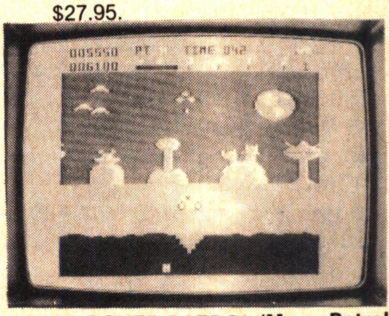
MS. GOBBLER (Ms. Pac*man)
Four mazes on a black background with bonus shapes make this the most challenging and fun maze game available. Eat an energizer dot and watch the ghost run! Requires 32K and joysticks. Cassette $24.95. Disk $27.95.

NOW TALKS!



FROGGIE (Frogger)
A race against the clock to get "Froggie" home safely is a worthy challenge for anyone! Crossing a busy highway and avoiding a pesky otter are some of the hazards. Requires 32K and joysticks. Cassette $24.95. Disk $27.95.

NOW TALKS!



LUNAR ROVER PATROL (Moon Patrol)
Charged with the task of exploring the moon, you must dodge, destroy, or jump over the many hazards from the sky and terrain. Good luck and enjoy your mission! Requires 32K and joysticks. Cassette $24.95. Disk $27.95.

NOW TALKS!

Add $3.00 for Disk

Galagon (Galaga)		32K	24.95
Whirlybird Run (Scramble)			24.95
ColorPanic (Space Panic)		32K	24.95
Qiks (Qix)	NOW TALKS!	32K	24.95
Ice Castles (Crystle Castles)		32K	24.95
Beam Rider (Spectral Original)			24.95
Decath-lon (Decathalon)		64K	24.95
Star Wrek (Star Trek)		32K	24.95
Syzygy (Spectral Original)	NOW TALKS!		24.95
Ghost Gobbler (Pac Man)			21.95
Keys of the Wizard (Advanced Adventure)	NOW TALKS!		19.95

SPECTRALOTTERY

WIN

A $200.00 Software Package From SPECTRAL ASSOCIATES

Spectral will enter your invoice number when your purchase $50.00 or more in merchandise by December 24th. The drawing will be held December 31st and the winner will be notified by January 15, 1985.

SHIPPING, HANDLING AND WARRANTIES

No C.O.D. orders. S & H: United States, add 3%, $2.00 minimum; Canada, add 6%, $3.00 minimum; Foreign, add 15%, $5.00 minimum. Washington residents add 7.8% sales tax. *All orders paid by credit card, money order or certified checks will be shipped within one business day or your game is free! If for any reason you are dis-satisfied with your software purchase, return the program with proof of purchase and we will refund the purchase price (does not include shipping and handling).

TOLL-FREE ORDERS ONLY
1-800-426-1830

ORDER STATUS & INFORMATION

1-206-581-6938

SPECTRAL ASSOCIATES
3418 South 90th Street
Tacoma, WA 98409

EXPRESS

ORDER

ORDER BY VISA OR MASTERCARD AND YOUR ORDER WILL BE SHIPPED WITHIN ONE BUSINESS DAY — GUARANTEED OR YOU GET THE GAME FREE!! HARDWARE ITEMS SUBJECT TO MANUFACTURERS AVAILABILITY.

We always must paint our array colors first, or they might reset a red or blue area. Often, you can use only one of these array colors at once, unless you have arranged your screen so that the arrays never overlap.

To get a better idea of how this is working, take a look at Figure 3. Here we have the makings of the helmet for Seattle. Since we wish to paint in silver, we have made the total helmet area black, and then overlay it with our silver array using *PUT* and *OR*. Notice that the Seahawk has been left completely white, to be colored in later with our regular *PAINT* colors.

You may ask: If you can get yellow and can paint blue, why can't you mix the yellow and blue to make a real green? Well, to be honest with you, I have tried that and it does not seem to work very well. Apparently, you can stretch these combinations only so far before you start getting messy.

This technique is not restricted to *PMODE 4*. You can try this method with your *PMODE3* color set. You will get some other variations, but I think that you will agree that the *PMODE 4* set with black and white is something we have grown very used to.

Try this version, and remember — you must select either the eight or the four in the "84" depending on which number is red. You may wish to try some screen dumps although you will not get these new colors on the color ink jet sprayer since combining blue, red, and white ink will not create yellow no matter how hard you try.

Some of you may want to try to merge parts one and two to have all 28 helmets in one program. This is not impossible, as you should have enough memory. You will run into a problem with the screen quiz section and the data since some city names have more than one team. Still, with a little effort I'm sure you can come up with a way. (Sure, I could tell you how, but you would never learn how to do any of this yourself if I did.)

For 16K

Those of you who want shorter versions can try typing in just the lines for each helmet. There is one catch. You must include Lines 70-200, and Lines 540-580 as well as any other subroutines which a given helmet might use. (You'll be able to tell when you are missing one.) Also include:

```
210 GOTO 600
```

This will prevent you from running into the subroutines. If you must include other subroutines, jump over them with a *GOTO* statement.

Maybe some of this is getting to be old hat, but fortunately, these helmets were not as tough as *Baseball Fever* or *Rockfest*. The sequels to those programs are in their formative stages now. I am planning at least another graphics treat before I return to a few educational applications which so many of you have written to me about.

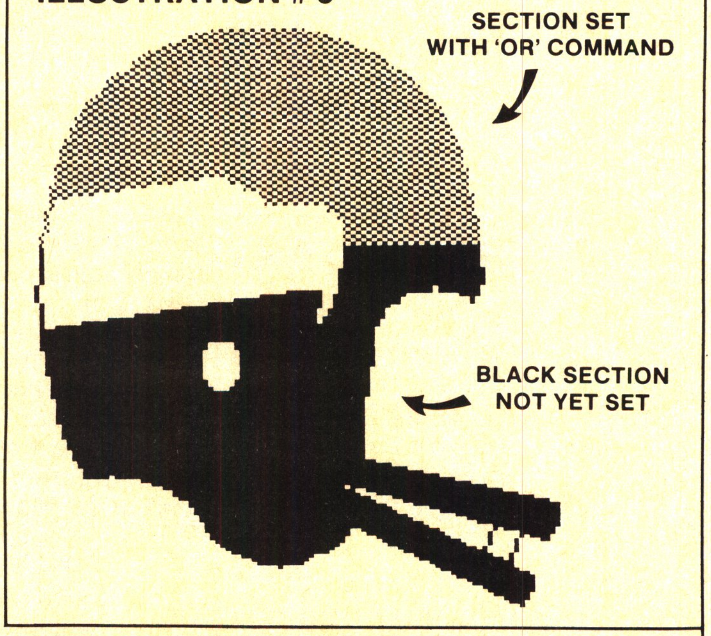
I have one final request, however. Many of you have written me with program lists and SASEs asking to help you try to find the bug you have made typing in the programs appearing in the "Wishing Well." I know that the inclusion of a SASE does tend to obligate me to some type of reply, but there have been so many requests like this that if I were to try to answer them, I would have no time to create each month's program(s). There have been no bugs in any of these listings yet. Any errors I have seen submitted to me have always been typing errors on your part. Therefore, if you can't find your bugs, you will get much quicker results by getting RAINBOW ON TAPE. I don't mean to keep pushing this issue but there is really no better deal available. You will find that your time is most certainly worth the few dollars it would cost per month to get a subscription. Then you know you will be getting bug-free versions.

Until next month, Merry Christmas, Happy Hanukkah and a Happy New Year to all of you.

180	12	1380	159
310	130	1510	219
530	254	1610	181
680	193	1710	215
790	126	1840	172
950	80	5050	156
1060	186	5290	230
1170	127	5500	107
1260	206	END	109

```
10 '******************************
20 '* FOOTBALL FEVER 84 PART 2 *
30 '*      BY FRED B. SCERBO     *
40 '* 149 BARBOUR ST.N.ADAMS.MA*
50 '*    COPYRIGHT (C)  1984     *
60 '******************************
70 CLEAR1000
80 CLS0
90 PMODE4,1:PCLS1:SCREEN1,1
100 CIRCLE(128,92),126,0,.45
110 PMODE3:FORX=0TO86STEP86:CIRC
LE(64,46+X),40,3,.8:CIRCLE(64,46
+X),54,3,.8:NEXTX:PAINT(64,10),3
,3:PAINT(64,96),3,3
```

ILLUSTRATION # 3



```
120 COLOR2,2:LINE(220,4)-(234,17
0),PSET,BF:LINE(140,4)-(154,90),
PSET,BF:LINE(140,90)-(256,104),P
SET,BF
130 X$=INKEY$:IFX$="8"THEN140ELS
```

SPECTRAL'S
House of Discount Software

30 games for under $30*

Spectral has done it again! We have gathered a great collection of 30 games and put them together in our New TREASURY PAC. Each game retails for $8 to $21. That's a $200 savings! Just look at the great games included:

$29.95

- *Artillery Duel
- *Whirling Dervish
- *Reno
- *Grabbitt
- *Tiny Calc
- *Alcatraz II
- *Laser Command
- *Space Traders
- *Yahtcc
- *C-Trek
- *Colorout
- *Croid
- *Game of life
- *Battlefleet
- *Lothar's Labyrinth

*cassette price; disk, add $4.00

- *Hang Twelve
- *Space Hogs
- *Klondike
- *Cosmic Superbowl
- *B-Invaders
- *Oil Magnate
- *Dungeon of Aritma
- *Kadoink
- *Boom or Bust
- *Eyewitness
- *Battletrek
- *Ecod
- *Concentrate
- *Lemons
- *Saipan

TRADITIONAL FAVORITES

Year after year, Color Computer owners everywhere have selected these Spectral arcade and adventure games as their favorites. They know they can look to Spectral for quality products and superior service. You have our guarantee you'll enjoy our games or your money back! Cassette prices; disk, add $3.00.

Planet Invasion	24.95	Android Attack	24.95	Space Sentry	21.95	Keys of the Wizard	19.95
Galax Attax	24.95	Defense	24.95	Star Spores	21.95	Syzygy	24.95
Cosmic Invaders	21.95	Ghost Gobbler	21.95	Space War	21.95	Prison City	9.95
Storm Arrows	21.95	Space Race	24.95	Lemans	14.95	Caverns of Doom	19.95
Devious	21.95	Color Zap	14.95	Gamblin Games	19.95	Pirates Ahoy	9.95

NOW TALKS!

EDUCATIONAL SOFTWARE

Turn your CoCo into the best learning tool available. Spectral's educational software uses the best graphics, color and sound to help make learning FUN!

Geography Pac (5 different studies)	29.95	Type Assault (Graphic Typing)	19.95	Horseplay (Vocabulary Builder)	19.95
Alpha Search (Alphabet Tutor)	14.95	Typing Tutor (Touch Typing)	19.95	Pickwhich (Shape Recognition)	9.95
Quiz Spin (Joker's Wild format)	19.95	Dollars and Sense (Money Teacher)	11.95	Spelling Master (Spelling Tutor)	14.95
Integer Math (Math Tutor)	14.95	School Maze (School Adventure)	11.95	Spanish Football (Spanish Tutor)	14.95

STOCKING STUFFERS

These items are sure to bring smiles on Christmas day. Each is priced under 10.00 to make enjoyable and economical stocking stuffers.

GAMES		UTILITIES AND BOOKS		ACCESSORIES	
Butterfly Bomber	9.95	Graphics-n-Text	9.95	C-10 Cassettes	.59¢
Color Poker	9.95	Color Computer Songbook	7.95	Diskette; SSDD	2.49
Space Traders	9.95	101 Color Computer Tips & Tricks	7.95	Blank Rom Pak Project Box	3.95
Game of Life	9.95	55 Color Computer Programs	9.95		
Sub Hunt	9.95	55 More	9.95		
Cosmic Superbowl	9.95	Color Computer Graphics	9.95		
Yahtcc	9.95	6809 Reference Card	1.95		

TOLL-FREE ORDERS ONLY 1-800-426-1830

ORDER STATUS & INFORMATION 1-206-581-6938

SPECTRAL ASSOCIATES

3418 South 90th Street
Tacoma, WA 98409

ORDER BY VISA OR MASTERCARD AND YOUR ORDER WILL BE SHIPPED WITHIN ONE BUSINESS DAY — GUARANTEED OR YOU GET THE GAME FREE!! HARDWARE ITEMS SUBJECT TO MANUFACTURERS AVAILABILITY.

SHIPPING, HANDLING AND WARRANTIES

No C.O.D. orders. S & H: United States, add 3%, $2.00 minimum; Canada, add 6%, $3.00 minimum; Foreign, add 15%, $5.00 minimum. Washington residents add 7.8% sales tax. *All orders paid by credit card, money order or certified checks will be shipped within one business day or your game is free! If for any reason you are dis-satisfied with your software purchase, return the program with proof of purchase and we will refund the purchase price (does not include shipping and handling).

EXPRESS ORDER

```
EIFX$="4"THEN150ELSE130
140 Z=0:ZZ=-20:R=3:B=2:GOTO160
150 Z=1:ZZ=8:R=2:B=3:GOTO160
160 REM START COLOR SET
170 PMODE4,1:PCLS0:SCREEN0,1:DIM
A(50),B(50),G(50),S(50),P(50):CL
S0:LINE(32,0)-(204,1),PSET,B
180 FORX=31TO203STEP4:PSET(X+Z,0
,0):PSET(X+2+Z,1,0):PSET(X+Z,4):
PSET(X+2+Z,5):NEXT:GET(32,0)-(20
4,1),A,G:GET(32,4)-(204,5),B,G
190 PCLS:FORX=32TO204STEP8:PSET(
X+Z,0):PSET(X+4+Z,1):LINE(X+Z,10
)-(X+1+Z,10),PSET:LINE(X+4+Z,10)
-(X+5+Z,10),PSET:LINE(X+2+Z,11)-
(X+3+Z,11),PSET:LINE(X+6+Z,11)-(
X+7+Z,11),PSET
200 PSET(X+1+Z,20):PSET(X+Z,21):
PSET(X+5+Z,21):NEXTX:GET(32,10)-
(204,11),S,G:GET(32,0)-(204,1),G
,G:GET(32,20)-(204,21),P,G
210 CLS0:PMODE4,1:PCLS1:SCREEN0,
1:PMODE3:CLS0
220 CLS:PRINT@67,"FOOTBALL FEVER
 '84  PART 2"
230 PRINT:PRINTTAB(4)"NATIONAL F
OOTBALL LEAGUE"
240 PRINT"  AMERICAN FOOTBALL CO
NFERENCE"
250 PRINT:PRINTTAB(7)"BY FRED B.
 SCERBO"
260 PRINTTAB(6)"COPYRIGHT  (C) 1
984"
270 PRINT:PRINTTAB(5)"A) AUTOMAT
IC DISPLAY"
280 PRINTTAB(5)"B) INDIVIDUAL DI
SPLAY"
290 PRINTTAB(5)"C) QUIZ ON TEAM
HELMETS"
300 X$=INKEY$:IFX$="A"THEN510ELS
EIFX$="B"THEN310ELSEIFX$="C"THEN
5010ELSE300
310 CLS:PRINT:PRINTTAB(7)"A) CLE
VELAND"
320 PRINTTAB(7)"B) SAN DIEGO"
330 PRINTTAB(7)"C) INDIANAPOLIS"
340 PRINTTAB(7)"D) PITTSBURGH"
350 PRINTTAB(7)"E) CINCINNATI"
360 PRINTTAB(7)"F) NEW YORK"
370 PRINTTAB(7)"G) BUFFALO"
380 PRINTTAB(7)"H) LOS ANGELES"
390 PRINTTAB(7)"I) HOUSTON"
400 PRINTTAB(7)"J) KANSAS CITY"
410 PRINTTAB(7)"K) NEW ENGLAND"
420 PRINTTAB(7)"L) DENVER"
430 PRINTTAB(7)"M) MIAMI"
440 PRINTTAB(7)"N) SEATTLE"
450 X$=INKEY$:IFX$=""THEN450
460 IFX$=CHR$(13)THEN RUN
470 IF X$<"A" THEN 450 ELSE IF X
$>"N" THEN 450
480 XX=ASC(X$)-64:ON XX GOSUB610
,670,760,830,950,1050,1130,1220,
1330,1410,1480,1580,1670,1780
490 X$=INKEY$:IFX$=CHR$(13)THEN3
10
500 GOTO490
510 FORXX=1TO14:ON XX GOSUB610,6
70,760,830,950,1050,1130,1220,13
30,1410,1480,1580,1670,1780
520 FORK=1TO900:IFINKEY$=CHR$(13
)THEN RUN ELSE NEXTK
530 NEXTXX:GOTO510
540 CIRCLE(118,46),80,BL,.6,.55,
.95:CIRCLE(88,72),56,BL,1.3,.39,
.6:CIRCLE(147,68),56,BL,1.3,.92,
.02:CIRCLE(184,88),26,BL,.7,.55,
.85
550 DRAW"BM160,84"+BL$+"D8L2D8L2
D18M-12,-4H4M-40,-10M-4,+12M+40,
+14NE4D4M+80,+28E4U4M-80,-28H4NE
6F4M+86,+18E4U6M-72,-12BM+58,+20
M-4,+8M-9,-2M+4,-8"
560 CIRCLE(124,124),34,BL,.7,.1,
.4:CIRCLE(60,144),40,BL,.6,.71,.
96:CIRCLE(102,92),10,BL,.9:RETUR
N
570 CIRCLE(110,110),4,W,.9:CIRCL
E(126,116),4,W,.9:RETURN
580 BL=1:FORY=0TO2:FORX=0TO1:CIR
CLE(118+Y,46),72-X,BL,.6,.53,.97
:CIRCLE(88+Y,72),48-X,BL,1.3,.35
,.6:CIRCLE(147+Y,68),48-X,BL,1.3
,.92,.02:NEXTX:NEXTY:RETURN
590 PAINT(110,106),2,3:PAINT(150
,122),2,3:PAINT(150,134),2,3:PAI
NT(210,140),2,3
600 'CLEVELAND
610 PMODE4,1:PCLS1:SCREEN1,1:PMO
DE3:BL=1:BL$="C1":GOSUB540
620 GOSUB580
630 PAINT(128,28),R,1
640 W=1:GOSUB570
650 RETURN
660 'SAN DIEGO
670 PMODE4:PCLS1:SCREEN1,1:PMODE
3:BL=1:BL$="C1":GOSUB540:GOSUB68
0:GOTO700
680 CIRCLE(108,54),82,BL,.6,.78,
.99:CIRCLE(108,50),64,BL,.6,.55,
.79
690 DRAWBL$+"BM116,06F6BM-74,+28
R4UR4M-8,+18M-4,+18D6M+20,-26M+2
0,-14R4UH2L2H2R10M+50,+4M-2,-8":
CIRCLE(122,68),66,BL,.6,.8,.99:D
RAW"BM+46,+32R2U14":RETURN
700 PAINT(128,20),1,1:PAINT(110,
106),1,1:PAINT(150,122),1,1:PAIN
```

UNLEASH THE TOTAL POWER OF YOUR COLOR COMPUTER

Merry Christmas

Introducing The "Super Smart" DATA PACK II TERMINAL COMMUNICATIONS

$34.95
Disk $44.95

- Support The PBJ 80 Column "Word Pak" & Parallel Printer Cards
- No Lost Information When Using Hi-Resolution Display On Line
- ASCII Compatible File Format
- Terminal Baud Rates 300 to 9600
- Automatic Word Wrap Eliminates Split Words
- Full/Half Duplex
- Automatic File Capture
- Programmable Word Length, Parity and Stop Bits
- Save and Load Text Buffer and Program Key Buffer to Tape or Disk
- 9 Hi-Res Display Formats, 28 to 255 x 24
- True upper/lower Case Display
- Kill Graphics Option for an Extra 6K
- Supports Line Break
- Freeze Display and Review Information On Line
- Send Files Directly from Disk Version
- Send Control Codes from Keyboard
- Separate Printer Baud Rates 110-9600
- Display on Screen or Output Contents of Buffer to Printer
- Automatic Memory Sense 16-64K
- 9 Programmable Function Key Variable Length Macro Buffer
- Programmable Prompt Character or Delay to Send Next Line
- Programmable Control Character Trapping
- Programmable Open/Close Buffer Characters
- Automatic Key Repeat for Editing
- Program and Memory Status Displays

Datapak II is a "Super Smart" Terminal Program which allows you to communicate with other computers, and computer information services at rates varying from 300 to 9600 baud. Datapack II is the ideal program for communicating with services like Compuserve, The Source, Bulletin Board Systems and the Dow Jones Information Service. It is written in fast efficient machine language code, and has automatic memory sensing for the Color Computer having 16 to 64K of RAM. It has an easy to use command set which consists of 2 or more characters that represent easy to remember words or phases. It has a built in help screen that can be displayed by simply hitting the enter key.

HI - RES II SCREEN UTILITY

- FULLY BASIC COMPATIBLE
- DISPLAY FORMATS OF 28 to 255 CHARACTERS PER LINE
- FULL 96 UPPER/LOWER CASE CHARACTERS
- MIXED GRAPHICS & TEXT OR SEPARATE GRAPHIC & TEXT SCREENS
- INDIVIDUAL CHARACTER HIGHLIGHTING
- REVERSE CHARACTER HIGHLIGHT MODE
- WRITTEN IN FAST MACHINE LANGUAGE
- AUTOMATIC RELOCTAES TO TOP OF 16/32K
- AUTOMATICALL SUPPORTS 64K OF RAM WITH RESET CONTROL
- ADJUSTABLE AUTOMATIC KEY REPEAT
- PROTECT 1-23 SCREEN LINES
- NO CODE KEYBOARD
- REVERSE SCREEN
- ON SCREEN UNDERLINE
- DOUBLE SIZE CHARACTERS
- ERASE TO END OF LINE
- ERASE TO END OF SCREEN
- HOME CURSOR
- BELL TONE CHARACTER
- HOME CURSOR & CLEAR SCREEN
- REQUIRES ONLY 2K OF RAM
- COMPATIBLE WITH ALL TAPE & DISK SYSTEMS

$24.95

HI-RES II SCREEN COMMANDER

This is the most advanced cost effective Screen Enhancement Utility available for the Color Computer. It allows greatest amount flexability, with either Basic or Machine Language programs. It is completely integrated in to the ROM Basic software of the Color Computer whether it has Standard, Extended or Disk Basic. It is completely compatible with Basic including the PRINT @ and CLS functions. It even expands the usefulness of the PRINT @ function by allowing it to be used with all of the line lengths available. It can even be made to be compatible with Model III programs using PRINT @ by setting the line length to 64 characters per line.

* * *

$34.95

CORES-64 & DISK EDT/ASM Editor/Assemblers W/Debug Monitor

Merry Christmas

Cores-64 w/Debug is an Editor/Assembler which supports the 16 to 64K Color Computer and TDP 100 Systems. It features a full Text Editor, an Assembler, and a Machine Language Debug Monitor. Cores-64 allows the user to Create, Edit Assemble, and Debug Machine Language Programs for the Color Computer. It will quickly and efficiently convert assembly language source into machine code files. Cores-64 does not require Extended Basic or Flex to take full advantage of a 64K RAM system. If you're using a 16K system you have only 3K of workspace available; in a 32K system, 19K is available; and in a 64K system there is over 52K of workspace available.

EDITOR

- Full Editor with over 25 commands
- Local and Global string search and replace
- Full featured line oriented screen editing
- Extremely fast in editing text files
- Easy Single keystroke edit commands
- Uses Basic/ASCII file format
- Editing Immediately updates the screen
- Move or copy single/multiple text lines

ASSEMBLER

- Supports full M6809 instruction set
- Cross Assembles 6800 source code
- Allows up to 66 character comments
- Supports standard assembler directives
- FDB & FCB allow multiple values
- Demo Program listing and source included
- Output listing to Screen or Printer
- Full text error messages

DEBUG

- Memory examine and change
- Go to specified address with stack contents
- Set and/or display up to 10 break points
- Remove single or multiple break points
- Display Processor Register contents
- Alter Processor Register contents
- Dump memory in Hex and ASCII format
- Fill memory with data byte
- Move block of memory
- Search memory for multiple byte sequence
- Disassemble memory into op-code format

INTRODUCE YOURSELF TO THE PRO GRAMMING EASE OF FULLSCREEN EDITING, SINGLE KEY ENTRY OF COMMANDS, AND A HOST OF DEBUGGING UTILITIES.

DISCOVER PLATINUM WORKSAVER AND WORKSAVER PLUS PROGRAMS. THESE PROGRAMS GIVE YOU THE POWER OF AN INTEGRATED WORD PROCESSOR AND PROGRAM UTILITY TOOL KIT FOR FAST EASY ENTRY AND DEBUGGING OF BASIC PROGRAMS.

Whether learning basic programming or exercising your expertise, you need the Worksaver.

- Tired of retyping to correct mistakes. Use of full screen editor.
- Tired of typing in all those commands. Use a single key for over 90 commands.
- Tired of starting over after each bug. Use out utilities to find and fix bugs while the program continues to run.
- x Tired of using the list command. Use the up and down error arrow keys to scroll program listing up and down the screen.
- x Tired of spending time worrying about program structure. Use our renumber routines to rearrange your program anyway you like.

• *worksaver and worksaver plus features* **$29.95**
x *additional worksaver plus features*

* * *

Merry Christmas

INTRODUCING TEXTPRO III "The Professionals" Word Processing System

$44.95
Disk $54.95

- Supports The PBJ 80 Column "WORDPAK" & Parallel Printer Cards
- 9 Hi-Resolution Display Formats: from 28 to 255 Columns by 24 lines
- True Upper/Lower Case Display
- Three Programmable Headers
- Programmable Footer
- Automatic Footnote System
- Automatic Memory Sense 16-64K
- Up to 48K of Workspace on 64K
- 10 Programmable Tap Stops
- 7 Tab Function Commands
- Automatic Justification
- On Screen Underlining and Double Size Characters
- Change Formatting at any time
- Edit files larger than memory
- Compatible with all printers
- Easily inbed any number of Format and Control Codes
- Typist Freindly lines and Command Format Entry
- Automatic Key Repeat

Text Editor

Textpro III has a full featured, line oriented screen editor. It supports single or multiple line copy and move, global or local search and replace of any character string, character insert and delete, block delete, adjustable speed automatic key repeat, single and automatic line edit, programmable underline and double width control coded, change screen background color and line lengths, automatic line numbering, line resequencer, and insert and delete line numbers. Textpro III uses fully compatible ASCII formatted files, that do not have to be converted like some of the other Word Processing Systems. It will Load, Save, and Verify Basic ASCII formatted tapes files. The Disk version supports Load, Save, Directory, Kill, Append, Text Process file from Disk, Roll part of file To Disk and Get next portion of file from Disk.

EXPRESS ORDER

ORDER BY VISA OR MASTERCARD AND YOUR ORDER WILL BE SHIPPED WITHIN ONE BUSINESS DAY

— GUARANTEED OR YOU GET THE GAME FREE!! HARDWARE ITEMS SUBJECT TO MANUFACTURERS AVAILABILITY.

SHIPPING, HANDLING AND WARRANTIES

No C.O.D. orders. S & H: United States, add 3%, $2.00 minimum; Canada, add 6%, $3.00 minimum; Foreign, add 15%, $5.00 minimum. Washington residents add 7.8% sales tax. *All orders paid by credit card, money order or certified checks will be shipped within one business day or your game is free! If for any reason you are dis-satisfied with your software purchase, return the program with proof of purchase and we will refund the purchase price (does not include shipping and handling).

TOLL-FREE ORDERS ONLY 1-800-426-1830

ORDER STATUS& INFORMATION
1-206-581-6938

SPECTRAL ASSOCIATES
3418 South 90th Street
Tacoma, WA 98409

```
T(150,134),1,1:PAINT(210,140),1,
1
710 FORI=0TO162STEP2:PUT(32,I)-(
204,I+1),A,OR:PUT(64,I)-(236,I+1
),A,OR:NEXTI:BL$="C1":GOSUB540
720 GOSUB680:PAINT(128,4),B,1:BL
=4:BL$="C4":GOSUB680
730 W=1:GOSUB570
740 RETURN
750 'INDIANAPOLIS
760 PMODE4,1:PCLS1:SCREEN1,1:PMO
DE3:BL=1:BL$="C1":GOSUB540
770 CIRCLE(118,46),74,1,.6,.53,.
97:CIRCLE(88,72),50,1,1.3,.35,.6
:CIRCLE(149,68),49,1,1.3,.92,.02
:PAINT(128,2),B,1
780 FORI=28TO38STEP10:CIRCLE(114
,52),I,1,.8,.97,.54:NEXTI
790 DRAW"BM78,48M+8,-22H2L2U2E2U
4M+12,+2F2M-10,+28BR52M-10,-28E2
M+12,-2D4F2D2L2G2M+8,+22":PAINT(
114,78),B,1
800 CIRCLE(114,76),2,4:CIRCLE(90
,66),2,4:CIRCLE(138,66),2,4:CIRC
LE(84,48),2,4:CIRCLE(146,48),2,4
:CIRCLE(92,26),2,4:CIRCLE(138,26
),2,4
810 W=1:GOSUB570
```

BILINGUAL SOFTWARE

FRENCH & ENGLISH INCLUDED
IN SAME PROGRAM

NEW MAZE GAME
CRIO MAZE
(WITH 20 MAZES INCLUDED)

1 Player	$29.95	Both (1-2 Players)	$39.95
2 Players	$35.95	Add. 20 Mazes	$19.95

GAMES

CRIO-BINGO (BINGO GAME BOARD)	$19.95
ANTI-INVASION (FAST ACTION GAME)	$19.95

FINANCE

GLCAL (GENERAL LEDGER)	$39.95
PMTCLA (PAYMENT CALCULATION)	$19.95
FINCAL (MORTGAGE CALCULATION)	$19.95

EDUCATIONAL

MATH 4 OP (MATHDRILL 4 OPS)	$19.95
MATHVALUE (EVALUATION PRIMARY GRADE)	$19.95

OTHER

TITCREAT (TITLE CREATOR)	$19.95

SOFTWARE ALSO AVAILABLE FOR VIC-20 & C-64
WRITE FOR INFORMATION

Bercom enr.

C.P. 488, SAINT-JEAN-SUR-RICHELIEU, QUEBEC, CANADA J3B 6Z8

ALL PRICES IN U.S. DOLLARS

```
820 RETURN
830 'PITTSBURGH
840 PMODE4,1:PCLS1:SCREEN1,1:PMO
DE3
850 TR$="D2G8L4D2R4F8D2R2U2E8R4U
2L4H8U2L2"
860 DRAW"BM120,22C1"+TR$:PAINT(1
20,34),1,1:FORY=20TO52STEP2:PUT(
32,Y)-(204,Y+1),A,OR:NEXTY
870 BL=1:BL$="C1":GOSUB540
880 DRAW"BM122,46C"+STR$(B)+TR$:
DRAW"BM138,34C"+STR$(R)+TR$
890 PAINT(122,50),B,B:PAINT(138,
38),R,R:FORY=0TO6STEP6:CIRCLE(11
4,44),38+Y,1,.75:NEXTY:PAINT(114
,2),1,1
900 PMODE4:DRAW"BM84,40C0L4D3R4D
3NL4BR4U4NL2NU2R2BR2R4D2L4NU2D2R
4BR2NR4U2NR4U2R4D2BR2U4D6BR2NR4U
2NR4U2R4D2BR2ND2NU2R2U2BR2NR4D2R
4D2L4":PMODE3
910 PMODE3:PAINT(110,106),1,1:PA
INT(150,122),1,1:PAINT(150,134),
1,1:PAINT(210,140),1,1:BL$="C4":
GOSUB550
920 W=4:GOSUB570
930 RETURN
940 'CINCINNATI
950 PMODE4,1:PCLS1:SCREEN1,1:PMO
DE3:BL=1:BL$="C1":GOSUB540:PAINT
(128,12),R,1
960 PAINT(110,106),1,1:PAINT(150
,122),1,1:PAINT(150,134),1,1:PAI
NT(210,140),1,1:BL$="C4":GOSUB55
0:W=4:GOSUB570
970 DRAW"C1BM56,122U4M-10,-26U16
M+6,-26M+8,-34BR4NU4D4R2D8M-8,+4
6L2D28M+6,+20":PAINT(58,120),1,1
980 DRAW"BR16BD2H4U2H2M-6,-14U10
M+6,-24E2U4M+20,-60BR24NU2D4M-36
,+60D2M-6,+12D20M+14,+28":PAINT(
78,122),1,1
990 DRAW"BU22BR2H4M-4,-16U6M+8,-
20E40M+12,-18BF4NU2M-12,+18M-32,
+40M-12,+18D24":PAINT(90,90),1,1
1000 DRAW"BE20BU6U6M+44,-60U8BF2
0NE6M-60,+50D4L4":PAINT(130,60),
1,1
1010 DRAW"BF10ND6E10M+60,-50FD4M
-60,+50G10D6":PAINT(150,66),1,1
1020 DRAW"BE16BR8U2E2U2E2U2M+46,
-26BD16NR4L6M-20,+4M-22,+10":PAI
NT(170,66),1,1
1030 RETURN
1040 'NEW YORK
1050 PMODE4,1:PCLS1:SCREEN1,1:PM
ODE3:BL=1:BL$="C1":GOSUB540:PAIN
T(128,12),1,1
1060 PMODE3:DRAW"C4BM46,70M+36,-
```

Books

6809 Programming Reference Card - Handy explanation of the 1.95
6809 instruction set 9.95
Color Computer Graphics - In depth study of Color Computer Graphics.............................. 9.95
55 Color Computer Programs - An introduction to Color Basic
55 More Color Computer Programs - Advanced Color Basic Programming for the Color Computer 9.95
101 Color Computer Tips & Tricks - Quick hints and tips that will enhance your basic skills and programs 7.95
Color Computer Songbook - Use this book and make your Color Computer Sing! 7.95
6809 Assembly Language Programming - The definitive Book on 6809 Assembly Language Programming 19.95

GRAPHICOM

THE BEST GRAPHICS PROGRAM EVER WRITTEN FOR THE COLOR COMPUTER!

* Powerful drawing tools: "rubber band" drawing; "stamps"; rotating pictures; mirrored, masked, and reversed images, and much more!

* Easy to use: uses two joysticks, or one joystick and koala pad; operated by a large, simple picture-based menu.

* Incredible output capacity: Transmit pictures over modems or amateur radio! GRAPHICOM even has a screen dump function that works with over 20 different printers!

* GRAPHICOM is simple enough that anyone can use it, yet it's so powerful that a seasoned artist can achieve new frontiers of creativity. Requires 64K and disk drive .... Only $29.95

Requires 64K and disk drive . . Only $29.95

FACTS

The FACTS book is a complete reference on the hardware of the Color Computer. It contains detailed technical information on all of the major components and a complete schematic of the computer. Several useful machine language software routines and a partial disassembly of Color Basic are also included. 14.95

BASIC PROGRAMMING TRICKS REVEALED

Basic programming tricks revealed contains everything you need to know to vastly improve your Basic programming skills. It includes several, never before published, practical examples and explanations of how to use PEEK, POKE, AND, OR, NOT VARPTR and several other obscure commands. Also included are many useful ways to fool Basic into doing some very powerful things that it normally would not do. Several tricks for Basic, Extended Basic, and Disk Basic are all included in this informative and useful book.

$14.95

Merry Christmas

Ultra-80CC: The best disk-based editor/assembler available! .... ML . . . D .49.95
Diskedt: Easy to use! Examine and/or repair disks .... D .24.95
Bugout: Powerful, yet compact machine language monitor . ML . . . D .14.95
Oracle: The full feature graphics machine language monitor .... 32K . . . ML . . . D .24.95
Soundsource: Input sound and analyze it in the computer ...... ML .14.95
Compuvoice: Add voice to your programs. A software voice synthesizer .... EB .24.95
Graphics-N-Text: A software Lower Case kit. Transparent to Basic ML. 9.95
Disassembler: Discover the secrets of your Machine Language Programs or ROMS .... EB .14.95
Flex +: The Professional Operating System for the Color Computer. Preferred to 0S9 5 to 1 .... 64K . . . ML . . . D .59.95

SHIPPING, HANDLING AND WARRANTIES

No C.O.D. orders. S & H: United States, add 3%, $2.00 minimum; Canada, add 6%, $3.00 minimum; Foreign, add 15%, $5.00 minimum. Washington residents add 7.8% sales tax. *All orders paid by credit card, money order or certified checks will be shipped within one business day or your game is free! If for any reason you are dis-satisfied with your software purchase, return the program with proof of purchase and we will refund the purchase price (does not include shipping and handling).

TOLL-FREE
ORDERS ONLY 1-800-426-1830

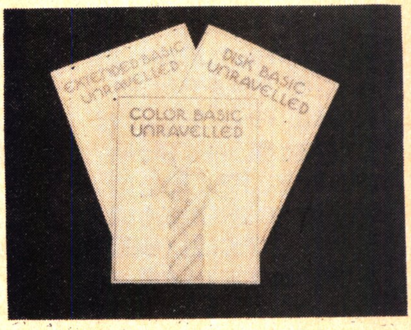
ORDER STATUS & INFORMATION
1-206-581-6938

SPECTRAL ASSOCIATES
3418 South 90th Street
Tacoma, WA 98409

COLOR BASIC UNRAVELLED

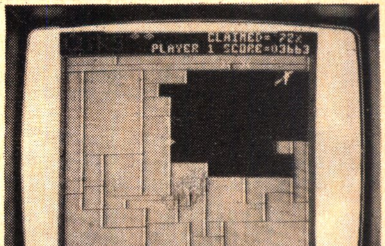
COLOR
BASIC 1.2/EXT.
BASIC 1.1/
"DISK BASIC 1.1"

UNLOCK THE SECRETS OF BASIC! All of BASIC'S innermost operating processes are exposed. This book is an indispensable tool for the programmer seeking a full, indepth knowledge of BASIC. BASIC UNRAVELLED will make it easy for you to write your own BASIC commands or modify BASIC for whatever purpose you desire.



- FULLY COMMENTED — NO HOLES
- ALL FCBs, FDBs and FCCs defined
- COMPLETE MEMORY MAP — NO MISSING SPACES EVERYTHING IS DEFINED
- PROGRAMMING TRICKS EXPLAINED
- EASY TO UNDERSTAND
- MOST RECENT ROM VERSIONS

COLOR BASIC UNRAVELLED	$19.95
EXTENDED BASIC UNRAVELLED	$19.95
DISK BASIC UNRAVELLED	$19.95
All 3 for	$49.95



NOW TALKS!

QIKS *(Qix)*

This game is for all you "Qix" lovers! Trying to 'color' the screen while dodging sparks isn't as easy as it sounds. Fast action & great graphics make this an exciting game. Requires 32K and joysticks.

CASSETTE: $24.95 DISK: $28.95

EXPRESS ORDER

ORDER BY VISA OR MASTERCARD AND YOUR ORDER WILL BE SHIPPED WITHIN ONE BUSINESS DAY — GUARANTEED OR YOU GET THE GAME FREE!! HARDWARE ITEMS SUBJECT TO MANUFACTURERS AVAILABILITY.

```
2M+6,-28M+80,-4NR6U2M-40,-3M-20,
-8M+6,+12M-40,+2M-6,+28M-20,+1L2
D4BM+36,-2BR8BUM+6,-24R2UR20D4L1
4D3LD3R14D4L15D3LD3R18D4L10DL16"
1070 DRAW"BR38BU2M+4,-20DL10U4R1
0UR14D4L8M-4,+20NL4BR12M+20,-1M+
2,-12M-8,-4U2M+10,-1U5M-18,+1M-2
,+12M+8,+4D2M-12,+1D4"
1080 PAINT(48,68),4,4:PAINT(98,6
6),4,4:PAINT(132,64),4,4:PAINT(1
56,64),4,4
1090 POKE178,153+Z+ZZ:PAINT(128,
6),,4
1100 PMODE3:BL=1:BL$="C1":GOSUB5
40
1110 RETURN
1120 'BUFFALO
1130 PMODE4,1:PCLS1:SCREEN1,1:PM
ODE3:BL=1:BL$="C1":GOSUB540:PAIN
T(128,12),R,1
1140 CIRCLE(118,46),74,1,.6,.53,
.97:CIRCLE(88,72),50,1,1.3,.35,.
6:CIRCLE(149,68),49,1,1.3,.92,.0
2:PAINT(128,2),B,1
1150 DRAW"C4BM52,72U6R2U2E4U4M+1
4,-3U2M+10,-18M+28,-6U2E2M+10,-2
UR16U2R2F2R4F2R4F4D2F2D2F2D2R4M+
10,+2F4D4M-4,+12L2G2L2G2L2D2G2D2
L6D2G2L2U4L4D2G2L2U6H4M-10,-1D8M
-14,+3H2L2DL2DL6E2U2E2R8U2R2U4L1
6D2L18DL8DL8G2L4G2DG2D2L6"
1160 PAINT(128,30),B,4:DRAW"BU20
BR4C1M+2,-12M+60,-3R30DR10G4D2G2
L40M-54,+6":PAINT(58,50),R,1:DRA
W"C4M+2,-12M+60,-3R30DR10G4D2G2L
40M-54,+6BR102BU10R4DL6DR4DL4DR4
DL4GL3"
1170 DRAW"BG20D4M-12,+2U2C"+STR$
(B)+"M+10,-2U4BL46BU2C4L10D2L4G2
D2G2R2C"+STR$(B)+"U2E2R4E3R10C4D
L10"
1180 PAINT(110,106),B,1:PAINT(15
0,122),B,1:PAINT(150,134),B,1:PA
INT(210,140),B,1:W=4:GOSUB570
1190 GOSUB540
1200 RETURN
1210 'LOS ANGELES
1220 PMODE4,1:PCLS1:SCREEN1,1:PM
ODE3:BL=1:BL$="C1":GOSUB540:DRAW
BL$:GOSUB1230:GOTO1240
1230 DRAW"C1BM112,22F4R4F2R6E2R6
E2D26G2D2G2D2G2M-12,+8G2L2G2L4H2
L2H2M-12,-8H2U2H2U2H2U26F2R6F2R6
E2R4E4":CIRCLE(112,50),12,1,1.2:
RETURN
1240 CIRCLE(112,50),12,1,1.2:PAI
NT(112,50),1,1
1250 PAINT(128,10),1,1:PAINT(110
,106),1,1:PAINT(159,122),1,1:PAI
NT(150,134),1,1:FORI=0TO162STEP4
:PUT(32,I)-(204,I+1),S,OR:PUT(33
,I+2)-(205,I+3),B,OR:PUT(64,I)-(
236,I+1),S,OR:PUT(65,I+2)-(237,I
+3),B,OR:NEXTI
1260 GOSUB1230:PAINT(112,28),1,1
:CIRCLE(112,56),10,1,1.2:PAINT(1
12,56),1,1:CIRCLE(112,56),10,4,1
.2:PAINT(112,56),4,4:CIRCLE(112,
56),10,1,1.2
1270 DRAW"C4BM102,58G4UE4BU12H8R
F2G2D2F2R2E2BR22BD2E8LG2F2D2G2L2
H2BD16F2UH4BH20BL14BUU6R4D2L4F4B
R4U6R4D2NL4D4BR4U6BR4ND6R2F3G3NL
2BR6U6NR4D2NR4D4R4BR4U6R4D2L4F4B
R4R4U4L4U2R4"
1280 DRAW"C1BG20L2C4NU8C1NU8LNU8
LNU8C4NU8C1L4BD2BL4C4NUND4BR16ND
4BL16C1BR2NR4DNR4DNR4DR4BU2BR4R3
BD2L2BD4L2NU4BD2L4R4NR4BD2L2R4"
1290 BL=1:GOSUB550:W=1:GOSUB570
1300 BL=1:BL$="C1":GOSUB540
1310 RETURN
1320 'HOUSTON
1330 PMODE4,1:PCLS1:SCREEN1,1:PM
ODE3:BL=1:BL$="C1":GOSUB540
1340 CIRCLE(118,46),80,B,.6,.55,
.95:CIRCLE(88,72),56,B,1.3,.39,.
```

EXCITING! AMAZING! HUMOROUS!

Meet "Professor AL"

(Copyright 1984)

Friend, Confidant,
Advisor, Playmate!!

Two years in the making. Now available for the first time!! Both BIG & LITTLE "Kids" love "Professor AL." YOU will, too !!!!!!!

- *Exciting, unique, unpredictable
- *Simulates human thinking through combined logic & data.
- *The "Prof" can teach you, AND you can teach him! (Even change his personality if you want to!)
- *He has good solid morals & can handle insults.
- *Program easy enough for a child; sophisticated enough for adults!!

(Must be run on at least a 32K TRS-80 Color Computer with Disk Drive)

ORDER TODAY! Disk & Explanation Literature

$30.00 + $3.00 shpg. & hdlg.

(Texas residents add 5⅛% Tax)

SANCHER ENTERPRIZE
3720 Brookside Dr.
P.O. Box 260213
Corpus Christi, TX 78426

Spectral's
House of Discount Hardware

LEGEND PRINTERS

No computer is ever complete until you have a printer. Hardcopy printout is essential for program development, education and business. Spectral's line of printers offers you the most in features for the lowest in price. All printers are full-feature with graphics capability.

PRINTERS	
Legend 800 (80cps)	295.00
Legend 1000 (100cps)	325.00
Legend 1200 (120cps)	370.00
Legend 1500 (150cps)	390.00
RS232 Card	100.00
Gemini 10X	315.00
Gemini 15X	430.00
RS232 Card	55.00
RS232 W/4K Buffer	80.00
Okidata ML82A (120cps) (built in RS 232 interface)	335.00

AMDEK COLOR MONITOR

Tired of blurry, fuzzy or grainy color on your TV set? The Amdek Color I monitor will change all of that and give you a perfect crystle clear picture. The cadillac of color monitors hooks up to your CoCo with our easy-to-install monitor driver.

AMDEK COLOR 1 (CCI Video driver $20 W/purchase)	299.00

HAYES SMARTMODEM

Allows your CoCo to communicate with other CoCos and/or database programs such as the SOURCE, DOW JONES, etc. Cable, software not included.

MODEMS	
HAYES SMARTMODEM 300 (300 BAUD, auto dial/auto answer)	220.00

Merry Christmas

SHIPPING, HANDLING AND WARRANTIES

No C.O.D. orders. S & H: United States, add 3%, $2.00 minimum; Canada, add 6%, $3.00 minimum; Foreign, add 15%, $5.00 minimum. Washington residents add 7.8% sales tax. *All orders paid by credit card, money order or certified checks will be shipped within one business day or your game is free! If for any reason you are dis-satisfied with your software purchase, return the program with proof of purchase and we will refund the purchase price (does not include shipping and handling).

DISK DRIVES
320K-$175*

Noël

Amazing but true. Now you can get 320K bytes of double sided disk storage for $175*. Latest technology half-high disk drive which may be configured as two single-sided drives by software or used as a double-sided drive under FLEX, 100% compatible with TRS-DOS and all hardware versions of the Color Computer.

*Case and power supply extra

Panasonic Double Sided; DD	175.00
Toshiba Double Sided; DD	195.00
Tandon Double Sided, DD	279.95

Includes software to convert to two single sided drives.

ACCESSORIES

Make your purchase complete . . . Spectral offers a full line of accessories necessary to fill all your programming needs.

CCI Monitor Adaptor	24.95
CCII Monitor Adapter	34.95
RS232 3 Way switchbox	29.95
C-10 Cassettes	.59
Diskette SSDD	2.49
Box of 10	19.95
Blank Rom Pak Project Box	3.95
64K Ram Expansion Kit	49.95
Disk (40 Pin) "Y" Connector	29.95
Head Cleaning Kits	9.95

Merry Christmas

TOLL-FREE ORDERS ONLY

1-800-426-1830

ORDER STATUS & INFORMATION

1-206-581-6938

SPECTRAL ASSOCIATES
3418 South 90th Street
Tacoma, WA 98409

32K/64K UPGRADES

Upgrade your Color Computer from 4K/16K to 32K/64K and realize the full potential of your computer. Only the CoCo II upgrade requires soldering. Complete, easy-to-read instructions for all CoCo Versions after the D Board.

$49.95

CHIPS		
4164 RAM		6.00
6809E CPU		19.95
6883 SAM		24.95
6821 PIA		8.00
6822 PIA		13.00
6847 VDG		14.95
2716 EPROMS	2.00 ea.	15.00/10
2732 EPROMS	3.50 ea.	30.00/10
16K RAMS		5.00/8
ROM Case	2.50 ea.	20.00/10

JOYSTICKS

We carry the highest quality, economically priced joysticks for the CoCo. The WICO redball is the industry standard arcade quality joystick against which all others are judged. Atari joysticks have stood the test of time as the most economical, easy-to-use joystick made.

JOYSTICKS	
Wico Joystick Adapter	19.95
Atari Joystick	12.95
Wico "Red Ball"	29.95

EXPRESS ORDER

ORDER BY VISA OR MASTERCARD AND YOUR ORDER WILL BE SHIPPED WITHIN ONE BUSINESS DAY — GUARANTEED OR YOU GET THE GAME FREE!! HARDWARE ITEMS SUBJECT TO MANUFACTURERS AVAILABILITY.

Noël

```
6:CIRCLE(147,68),56,B,1.3,.92,.0
2
1350 CIRCLE(118,46),72,R,.6,.52,
.95:CIRCLE(88,72),48,R,1.3,.35,.
58:CIRCLE(147,68),50,R,1.3,.90,.
03
1360 COLORB,B:LINE(98,20)-(122,2
2),PSET,BF:LINE(92,40)-(128,42),
PSET,BF:FOR OP=1TO4:LINE(104+OP,
14)-(88+OP,70),PSET:LINE(112+OP,
14)-(128+OP,70),PSET:NEXT OP
1370 LINE(104,14)-(116,12),PSET,
BF:DRAW"BM110,32NE10NF12NG12NH10
BD20NE10NF16NG16NH10BD6C"+STR$(R
)+"F16R12M-6,-28R2U10L4M-3,-12R2
U4L2U2H4U4L22D4G4D2L2D4R2M-3,+12
L6D10R2M-6,+28R12E16"
1380 PAINT(110,106),R,1:PAINT(15
0,122),R,1:PAINT(150,134),R,1:PA
INT(210,140),R,1:W=4:GOSUB570
1390 RETURN
1400 'KANSAS CITY
1410 PMODE4,1:PCLS1:SCREEN1,1:PM
ODE3:BL=1:BL$="C1":GOSUB540
1420 DRAW"C1BM72,56U24M+14,+2U10
R20M+28,+4M+16,+6M+12,+8F4G4M-12
,+8M-16,+6M-28,+4L20U10M-14,+2U1
0":PAINT(128,4),R,1
```

```
1430 DRAW"BR18U4R4U10L4U4R12D6E6
R12D4L4G6F6R4D4L12H6D6L12NU2R8D2
F2R4DR4DR14UR4UR4E2U2H2L2G2L4D2L
10UL2UBU8BR4E2R4UR4DR2D2R6U6L4DL
2UL10DL2"
1440 PAINT(102,44),R,1:PAINT(106
,54),R,1:PAINT(114,40),R,1
1450 W=1:GOSUB570
1460 RETURN
1470 'NEW ENGLAND
1480 PMODE4,1:PCLS1:SCREEN1,1:PM
ODE3:BL=1:BL$="C1":GOSUB540
1490 CIRCLE(118,46),74,1,.6,.53,
.97:CIRCLE(88,72),50,1,1.3,.35,.
6:CIRCLE(149,68),49,1,1.3,.92,.0
2:PAINT(128,2),R,1
1500 CIRCLE(112,22),10,1
1510 DRAW"C1BM70,80R12UL10UR8UL6
U6R2U6R2U4M+8,-12E2M+2,+14G4NL8D
4LD4G4BR14NU6F2R2U6E2R2DR2D2R4D4
G2L2G2L2H2BE8BD2R4U2H2L2H2U4L4G2
NG4H2L2H2U2E2R2E2R4F2ND6H2U2E2R4
E2U6NR4L2G2L2G2L2H2U6"
1520 DRAW"R2U2R4U2H6L4G2L2U2L2M-
4,+8D4F6BU16U4E2R2E2NR6F12R2U4R4
ND8BR6NU4R4U4R2U6NL2E2R2D12L2D2G
2L2D2G2R4D4L4NH4G4NH4G4NU8G2D4F2
R4E2U2E2NH6R2E8U2NL6D2R4U2R4U6L2
```

Continued from Page 124

Dungeons & Dragons Best Of Show goes to Eric and Mark Riel of Kent, Wash., for *The Halls Of Dungeon Death*. This fine little program combines features of arcade graphics and cursor movement with the more common Adventure commands. With enough machine language routines to make the program extremely fast, it remains exciting for as long as the player can hang onto the keyboard. Also, it features one of the best graphics title screens of all the contest entries.

Non-Graphics Best Of Show And Third Place Award goes to Gregory Clark of Syracuse, N.Y., for his two entries, *Kragnor & Flodnar* and *Sir Randolf Returns*. Both programs were so good and, also, so similar in several respects, that the judges could not separate the two. (So similar, in fact, that Flodnar is Randolf spelled backwards!) Greg's name manages to crop up among the winners in every contest held by THE RAINBOW. He and Sir Randolf took the non-graphics top award in last year's Adventure contest and he also made a respectable showing in the first Simulation contest, winning an award for his program, *Flood*. In Greg's games, you can always expect the unexpected. For instance, *Kragnor & Flodnar* begins in a store where purchases must be made among more than 100 items. How's that for getting a game off to a complex start?

Graphics Runner-Up And Second Place Award goes to Carmen DiMichele of Linwood, N.J., for *Castle Thuudo*. This is a disk-based Adventure that accesses the disk for each and every graphics picture. If you have not upgraded to disk drives yet, this program alone should be enough to spur you to the purchase. In the quest to discover and defeat the evil Thuudo, leader of the gods, you will encounter breathtaking graphics screens at every turn. And the final battle with evil is one you will never forget.

Graphics Best Of Show And Grand Prize is presented to an Adventure that has it all: *Rescue On Alpha II*, by Steven Mitchell of Tomahawk, Wis. This game has enough dazzling graphics and random elements that even the most experienced Adventurer should find it challenging time after time. As befits an Adventure of this magnitude, no mere kingdom or treasure is at stake, but rather the entire galaxy. Seriously, this game has so many things going on that it causes a minor problem; if you leave the game sitting untouched for a couple of hours, it will run itself out of memory. Of course, chances are that one of the roving killer robots will finish you off long before that happens. In this program, the Adventure continues even while the player is taking a break.

I wish that it were possible to mention all the entries that showed promise, yet were ruled out for one reason or another. It was a terribly, terribly difficult process choosing these winners from the field and the judges sincerely hope that we have done them all the justice that they each deserve. For now, though, let's move on to *Rescue On Alpha II* and *The Head Of The Beast* to see a couple of fine examples of what The Second Annual Rainbow Adventure Contest has produced.

THE COLORSOFT™ BUSINESS SYSTEM

INTEGRATED BUSINESS SOFTWARE DESIGNED FOR THE COLOR COMPUTER
WRITTEN FOR USE BY THE NON-ACCOUNTING ORIENTED BUSINESSMAN
CONCISE USERS MANUAL WITH SAMPLE TRANSACTIONS TUTORIAL
PROFESSIONALLY WRITTEN AND FULLY TESTED
HIGHLY USER FRIENDLY AND MENU DRIVEN
AFTER THE SALE SUPPORT

SMALL BUSINESS ACCOUNTING (Version 2.0) This sales-based accounting package is designed for the non-accounting oriented businessman. It also contains the flexibility for the accounting oriented user to set up a double entry journal with an almost unlimited chart of accounts. This package includes Sales Entry, transaction driven Accounts Receivable and Accounts Payable, Journal Entry, Payroll Disbursement, and Record Maintenance programs. Screen and hardcopy system outputs include Balance Sheet, Income Statement, Customer and Vendor Status Reports, Accounts Receivable and Payable Aging Reports, Check Register, Sales Reports, Account Status Lists, and a Journal Posting List. The number of accounts is limited only by the number of disk drives. $89.95

ACCOUNTS RECEIVABLE (Version 2.0) This package is designed to meet the requirements of most small business users. The system includes detailed audit trails and history reports for each customer, prepares invoices and monthly statements, mailing labels, aging lists, and an alphabetized customer listing. The user can define net terms for commercial accounts or finance charges for revolving accounts. This package functions as a standalone A/R system or integrates with the Small Business Accounting package to build a complete accounting/receivables system. $59.95

PAYROLL (Version 2.0) This integratable package is designed for maintaining personnel and payroll data for up to 200 hourly and salaried employees with 8 deductions each. This system calculates payroll and tax amounts, prints checks and maintains year-to-date totals. These amounts can be automatically transferred to the SBA package for financial reporting. It computes each pay period's totals for straight time, overtime, and bonus pay and determines taxes to be withheld. Additional outputs include mailing list, listing of employees, year-to-date federal and/or state tax listing, and a listing of current misc. deductions. This system is suited for use in all states except Oklahoma and Delaware. $69.95

All programs require a minimum of 32K and 1 disk drive but will take advantage of 64K and multiple drives. Each package features a hi-res 51 x 24 black on green screen. 16K versions available without hi-res screen. Specify 16K or 32K versions when ordering. Future integrated packages will include: Inventory Control, Sales Analysis, Accounts Payable.

INCLUDE $5.00 Shipping/Handling Per Order **Write for Free Catalog**

BRANTEX, INC.
COLOR SOFTWARE SERVICES DIV.

BUSINESS SOFTWARE GROUP
P.O. BOX 1708
GREENVILLE, TEXAS 75401

TELEPHONE ORDERS
(214) 454-3674
COD/VISA/MASTERCARD

ATTENTION DEALERS: WE OFFER THE BEST DEALER PLANS AVAILABLE

```
U2R2U8R2U6H2L2H2L4G2BD22BR10D2F2
D4F2D4G2D2F2D6L2D6F4"
1530 DRAW"R4FL6GR8FL20U6H2U2H2U4
NR12H2U6H6":PAINT(78,72),R,1:PAI
NT(94,56),1,1:PAINT(100,80),R,1:
PAINT(136,76),R,1:PAINT(136,30),
1,1:PAINT(122,24),1,1:PAINT(100,
26),1,1
1540 DRAW"BM106,20C"+STR$(R)+"ND
6BR4ND8BR4ND6BR4ND6UC1NL12UR2NL1
8UC"+STR$(R)+"R2L24UR24UL24":DRA
W"R8U6R2ND6R2ND6R4ND6R2ND6D5NR8N
L20BD8C1L2BL4NL2BD2R4BD4L4NH2R4N
E2BD30C"+STR$(R)+"NU6BR4NU6BG12B
D2H4L4G2D4"
1550 PAINT(110,106),B,1:PAINT(15
0,122),B,1:PAINT(150,134),B,1:PA
INT(210,140),B,1:W=4:GOSUB570
1560 RETURN
1570 'DENVER
1580 PMODE4,1:PCLS1:SCREEN1,1:PM
ODE3:BL=1:BL$="C1":GOSUB540
1590 PAINT(128,4),B,1
1600 CIRCLE(118,46),74,4,.6,.53,
.97:CIRCLE(88,72),50,4,1.3,.35,.
6:CIRCLE(149,68),49,4,1.3,.92,.0
2
1610 CIRCLE(118,48),30,4,1,.8,.2
:CIRCLE(116,48),18,4,1,.8,.17:DR
AW"BM84,20C4NR44D12R8D30L8D12NR4
4R22BU12NR18U30NR12":PAINT(128,2
4),R,4
1620 DRAW"D30E4U6L2U6L2U6L2U4LU2
E2R2NR8E2R4F4R2F4D2G2L4D2F2R2F2R
2D6E6R2NF6D2NF6LUG6L4ND6R6F4D2":
PAINT(116,54),4,4
1630 DRAW"C"+STR$(B)+"BH10BL2H4B
L8U2R2U4H4U2NL2U2R4BR6BD2DBD4F2R
2BR4BU2C4R2F2R2M+14,+4DM-14,-4"
1640 W=1:GOSUB570
1650 RETURN
1660 'MIAMI
1670 PMODE4,1:PCLS1:SCREEN1,1:PM
ODE3:BL=1:BL$="C1":GOSUB540
1680 CIRCLE(118,46),80,R,.6,.55,
.95:CIRCLE(88,72),56,R,1.3,.39,.
6:CIRCLE(147,68),56,R,1.3,.92,.0
2
1690 CIRCLE(118,46),72,B,.6,.52,
.95:CIRCLE(88,72),48,B,1.3,.35,.
58:CIRCLE(147,68),50,B,1.3,.90,.
03
1700 FORYI=0TO4:CIRCLE(112,46),3
2+YI,R,.8:NEXTYI
1710 DRAW"BM96,80C"+STR$(B)+"U4E
2U2E2U2H2U2H2U6L2U10L4UL4U2R2E2R
2E2R2E2R2U2R2U2R2U2R2U2E2R2E2R8U
2R14D2R4D4R6F2R2D4M-14,+2G2D2G2D
6G2L2H2U4G2D2G2D6G2L4H2U2G2D2G2D
4G2D4F2R4F2D2L6U2L4G4L4":PAINT(1
12,46),B,B
1720 FORYI=1TO6:CIRCLE(133+YI,58
),36,4,.8,.45,.75:NEXTYI
1730 DRAW"BU50BR34C4R4UNH4BD4NR6
FNR8FNR10":CIRCLE(126,22),10,1,.
8:PAINT(126,26),4,1:CIRCLE(130,2
2),10,R,.8,.75,.2:DRAW"BH10BL4C"
+STR$(R)+"U4R2F2ND2E2R2D4"
1740 PMODE4:CIRCLE(136,58),36,0,
.8,.45,.75:PMODE3
1750 PAINT(110,106),B,1:PAINT(15
0,122),B,1:PAINT(150,134),B,1:PA
INT(210,140),B,1:W=4:GOSUB570
1760 RETURN
1770 'SEATTLE
1780 PMODE4,1:PCLS1:SCREEN1,1:PM
ODE3:BL=1:BL$="C1":GOSUB540
1790 GOSUB1800:GOTO1810
1800 DRAW"C1BM40,46M+60,-6R4F2R4
F2R4F4R22F2R2F2R2D14L2D6G2D2G6L2
U4E2U4L8M-98,+10":RETURN
1810 PAINT(128,6),1,1:PAINT(110,
106),1,1:PAINT(159,122),1,1:PAIN
T(150,134),1,1:FORI=0TO162STEP2:
PUT(32,I)-(204,I+1),S,OR:PUT(64,
I)-(236,I+1),S,OR:NEXTI
1820 GOSUB540:GOSUB1800
```

ENHANCED 1248-EP EPROM PROGRAMMER

Directly compatible with EPROMs 2508, 2716, 2532, 2732, 68732-O-1, 68764 & 64766. No personality modules required. Adapter extends capability for 2564. Menu driven, the 1248-EP is suitable for both experienced and novice operators.

Functions include: 1) ERASURE VERIFICATION; 2) COMPARE EPROM TO REFERENCE; 3) BLOCK PROGRAMMING; 4) BYTE PROGRAMMING; 5) DUMP EPROM TO RAM; 6) JUMP; 7) RETURN TO EPROM MENU.

Other features: 1) Error detection & location; 2) Intelligent algorithm reduces programming time; 3) Textool ZIF socket; 4) On-board programming supply; 5) Extra PIA port supports parallel communications with handshake; 6) Firmware in on-board EPROM.

Comes with complete documentation.

Price is $129.95

A/D-80C ANALOG TO DIGITAL CONVERTER

- 16 A/D channels.
- 8 or 10 bit resolution.
- 9K conversions/second.
- Auto-ranging or sample/hold.
- Large wirewrap area for custom signal conditioning & growth.
- On-board PIA provides user control of stimulus.
- On-board EPROM location for user software.
- Documentation includes: data sheets on key parts, BASIC and machine language programming examples, and signal conditioning circuit diagrams.

Price is $149.95

2-PORT EXPANSION INTERFACE

- Buffered expansion interface.
- Splits $FF40-$FF5F area in half.
- Disc port uses $FF40-$FF4F.
- Second port uses $FF50-$FF5F.
- Enables simultaneous use of disc & other devices, e.g., the 1248-EP or the A/D-80C.

Price is $89.95

ORDERING INFORMATION

U.S. residents add $3.00, Canadians add $10.00 for shipping/handling. Arizona residents add 5% sales tax. Make checks/money orders payable to

COMPUTER ACCESSORIES
OF ARIZONA
5801 E. VOLTAIRE DRIVE
SCOTTSDALE, ARIZONA 85254
(602) 996-7569

DM001 PRETTY PRINTER

WORKED FLAWLESSLY-DOES ITS WORK EFFICIENTLY- *THE RAINBOW JUN '84*

US 13.95(T)-17.95(D) CDN 15.95(T)-19.95(D)

DM002 P. U. F. F.

TURN ANY ASCII WORD PROCESSOR INTO A SUPER PRINTER FORMATTER.

US 13.95(T)-17.95(D) CDN 15.95(T)-19.95(D)

DM003 DATAMAIL

DATAMAIL IS FAST - FLEXIBLE

THE RAINBOW JULY '83

US 16.95(T)-20.95(D) CDN 19.95(T)-23.95(D)

DM004 COCOCOPY

BACKUP YOUR BASIC OR M/L PROGRAMS. CORRECT TAPES WITH I/O ERRORS.

US 13.95(T) CDN 15.95(T)

DM005 FIRST SAMPLER-6 PROGRAMS

FUN TO PLAY AND EDUCATIONAL AS WELL- OUTSTANDING- *THE RAINBOW OCT '83*

US 13.95(T)-17.95(D) CDN 15.95(T)-19.95(D)

DM006 CONVERT

SHOWS RELATIONSHIP BETWEEN VARIOUS SYSTEMS OF MEASUREMENT-EDUCATIONAL

US 13.95(T)-17.95(D) CDN 15.95(T)-19.95(D)

DM007 AMORTISE

PRINT YOUR OWN AMORTISATION CHARTS. SELL TO LAWYERS, REAL ESTATE AGENTS.

US 13.95(T)-17.95(D) CDN 15.95(T)-19.95(D)

DM008 NEWERROR

CREATED AND PACKAGED WITH CARE- I WAS IMPRESSED- *RAINBOW APRIL '84*

US 16.95(T)-20.95(D) CDN 19.95(T)-23.95(D)

DM009 EXECCART

EXTREMELY EASY TO USE - WORKED FLAWLESSLY - *THE RAINBOW MAY '84*

US 16.95(T)-20.95(D) CDN 19.95(T)-23.95(D)

DM010 THE SPOOLER

SPOOLS PRINTER OUTPUT FOR ANY COCO. EXTENDED BASIC NOT REQUIRED.

US 13.95(T)-17.95(D) CDN 15.95(T)-19.95(D)

DM011 BONES 16K

AN ORIGINAL DICE GAME FOR THE WHOLE FAMILY-SIMPLE YET ADDICTIVE.

US 13.95(T)-17.95(D) CDN 15.95(T)-19.95(D)

DM012 MUSIC EDITOR

PRINT PLAY BY NUMBER MUSIC FOR C OR G ORGANS-ALSO AVAILABLE FOR MC10.

US 13.95(T)-17.95(D) CDN 15.95(T)-19.95(D)

DM013 HOME INVENTORY

SMALL DATABASE TO FILE, STORE & SORT LISTS OF HOUSEHOLD ITEMS.

US 13.95(T)-17.95(D) CDN 15.95(T)-19.95(D)

DM014 IN ASSEMBLY LANGUAGE

A BOOK TO TEACH ASSEMBLY LANGUAGE, INCLUDES SOURCE CODE OF ALL EXAMPLES

US 25.95(T)-29.95(D) CDN 29.95(T)-33.95(D)

DM015 SCREEN+

MULTIPLE FUNCTION UTILITY-SCREEN DUMP, KEY REPEAT, AUTO LINE NUM. ETC.

US 16.95(T)-20.95(D) CDN 19.95(T)-23.95(D)

DM016 SUPER EDIT

I GIVE IT FULL MARKS -

THE RAINBOW JULY '84

US 16.95(T)-20.95(D) CDN 19.95(T)-23.95(D)

DM017 CLUB CONTROL

SMALL DATABASE TO TRACK COMPUTER CLUB LIBRARY ACTIVITIES.

US 16.95(T)-20.95(D) CDN 19.95(T)-23.95(D)

DM018 MINER

HI-RES ALL M/L GAME OF STRATEGY FOR THE YOUNGER CROWD - ENTERTAINING.

US 13.95(T)-17.95(D) CDN 15.95(T)-19.95(D)

DM019 PAYCHECK

FINANCIAL DATABASE KEEPS TRACK OF YOUR INCOME AND DEDUCTIONS.

US 20.95(D) CDN 23.95(D)

DM020 ADVENTURE IN BIPLAND

A GREAT ONE-YOU'LL BE DELIGHTED WITH THIS PROGRAM- *HOT COCO SEPT. '84*

US 13.95(T) CDN 15.95(T) 16K MC10 ONLY

DM021 RAM DOS

USE UPPER MEMORY LIKE A SUPER FAST DISK DRIVE. WORKS WITH 16, 32 OR 64K

US 25.95(T)-29.95(D) CDN 29.95(T)-33.95(D)

DATAMAT
INTERNATIONAL

```
1830 DRAW"BU16M+30,-3F8G8BR6BUE8
U4L2U4R2E2U2E4R10F2R4E6H2L2G4H2L
14M-16,+8M-30,+3BM+40,-4BR10R4M+
8,+4G4L2D2L8H2M+4,-8BR20BD10E4U1
0R28F4D14U4L34":PAINT(44,50),1,1
:PAINT(44,70),B,1
1840 DRAW"C4L10D2L10D2L4D2L2D4BR
6U2R2U2M+40,-4R10NU6D6":CIRCLE(8
8,62),4,B
1850 W=1:GOSUB570
1860 RETURN
5000 REM QUIZ BODY
5010 PCLS:DIMAA$(90),X(51),R(51)
,AO(50),A$(50),B$(50),NP(50):CLS
0:D=1:M$=","
5020 FORI=0TO250STEP6:K=K+1:X(K)
=I:NEXT:FORP=8TO58:READC$:AA$(P)
=C$:NEXT:GOTO5130
5030 DATA BR2HU3E,BREU3H,BU5BRFN
LNGNENRNF,BU3BR2DNLNRD,BRUNRDRDG
,BRBU2R2,BRRUL,UE3U,BRHNE3U3ERFD
3GL,R2U5NLD5R
5040 DATA NR3UEREUHLG,BUFREUHNLE
UL3,BR3U5D3L3UE2R,BUFREUHL2U2R3,
BUFREUHLGU2ER,BU4UR3D2G3,BUFREUH
LNGHERFG,BRREU3HLGDFRE,BR2UBU2U,
BR2NEUBU2URDLBD3RDG,BR2H2UE2,BRB
UNR2BU2R2,BRE2UH2,BR2UBU2REHL2,,
U2NR3U2ERFD4
5050 DATA U3NR2U2R2FGFDGL2,BUU3E
RFBD3GLH,U5RF2DG2L,NR3U3NR2U2R3,
U3NR2U2R3,BUU3ERBRBD3NLDGLH,U3NU
2R3NU2D3,BRU5,BUFEU4NRL2,U5D2RE2
G2F2D,NU5R3,U5FDRUED5,U5F3U3D5,U
5R3D5L3,U5R2FDGL2,BUU3ERFD3NHNFG
LH,U5R2FGL2F3,BUFREUHL2UERF
5060 DATA BRU5LR3,NU5R3U5,BU5D3F
DRUEU3,NU5EU2RD2FU5,UE2H2BR3DGNL
FD2,BU5D2FRD2NLU2EU2,NR3UE3UL3
5070 IF LEN(JK$)<=42THEN5110
5080 FOR T=42TO0STEP-1:IF MID$(J
K$,T,1)=" "THEN5100
5090 NEXT T:GOTO5110
5100 L$=LEFT$(JK$,T):W$=L$:GOSUB
5120:JK$="     "+RIGHT$(JK$,(LEN(
JK$))-T):GOTO5070
5110 W$=JK$:GOSUB5120:RETURN
5120 SL=LEN(W$):DRAW CC$:FORI=1T
OSL:B$=MID$(W$,I,1):C=ASC(B$)-32
::DRAW"BM"+STR$(X(I))+","+STR$(Y
):DRAW AA$(C):NEXTI:RETURN
5130 REM READ DATA
5140 FORJ=1TO14:READ A$(J),B$(J)
5150 NEXTJ
5160 REM START QUIZ
5170 CC$="C0"
```

ORDER TOLL FREE

1-800-437-4757 EXT. 241

HERE IT IS. . .

The Standard
BASIC
Dictionary
for Programming

RAINBOW CERTIFICATION SEAL

JOHN P. STEINER

Here are all the definitions, sample commands and information on functions, statements and operations you need to quickly adapt and run a BASIC language program.

- *Covers virtually ALL versions of BASIC.
- *Quick reference syntax guide.
- *Includes graphics & file commands.
- *Each word is cross referenced to other words with identical or similar functions.

PLUS:
A complete appendix includes programming techniques, graphics, file handling, many useful charts, references and more. 230 pages in book.

ONLY

$19.95

Plus $2.00
Shipping & Handling

Computer
Associates

Dept. R
Box 683
West Fargo, ND 58078

VISA MasterCard

Send SASE for CoCo Support catalog.

FREE **10 DISKETTES OR 20 C-20 CASSETTES**

A subscription to the **'Coco-Cassette'** gets you a tape or disk full of 10 **quality programs** delivered to you by first class mail every month. The documentation included will help you run great **utilities** like 'Word Processor,' and 'Budget Analyzer,' or enjoy great **games** like 'Frogjump' and 'Caterpillar Cave' **FOR AS LITTLE AS 46 CENTS EACH!**

★ **Limited offer** ★ Subscribe for a year on cassette and receive **20 Free C-20 cassettes** or subscribe for a year on disk and receive **10 Free 5¼ single sided double density diskettes!**

Now available on disk!

PRICES

	TAPE	DISK
1 YR (12 ISSUES)	55^{00}	70^{00}
6 MO (6 ISSUES)	30^{00}	40^{00}
Single Copies	6^{00}	8^{00}

Mich. Res. add 4%
Overseas ADD $10 to subscription and $1.00 to single issues.

★ 16K extended required
★ Some programs require 32K, and/or disk
★ Over 3000 satisfied customers
★ Back issues available from July '82 (over 280 programs to choose from!)
★ Also available for Commodore 64.

PERSONAL CHECKS WELCOME!

MasterCard

T&D

T & D Subscription Software
P.O. BOX 256-C
HOLLAND, MI 49423
(616) 396-7577

VISA

```
5180 J=J-1
5190 FORI=1 TO J
5200 AO(I)=RND(J)
5210 IF NP(AO(I))=1 THEN 5200
5220 NP(AO(I))=1
5230 NEXTI
5240 FOR P=1TOJ
5250 ZW=VAL(A$(AO(P)))
5260 FOR Q=1TO3
5270 C(Q)=RND(J):IF C(Q)=ZW THEN
5270
5280 FOR K=Q-1 TO 0STEP-1:IF C(K
)=C(Q) THEN5270
5290 NEXTK
5300 NEXTQ:C(4)=ZW
5310 FOR E=1TO4
5320 F(E)=RND(4)
5330 FOR K=E-1 TO 0 STEP-1:IF F(
K)=F(E) THEN5320
5340 NEXTK:NEXTE
5350 ON ZW GOSUB610,670,760,830,
950,1050,1130,1220,1330,1410,148
0,1580,1670,1780
5360 PMODE4
5370 Y=166:JK$="    1) "+B$(C(F(1
))):GOSUB5070
5380 JK$="
 2) "+B$(C(F(2))):GOSUB5070
5390 Y=176:JK$="    3) "+B$(C(F(3
))):GOSUB5070
5400 JK$="
 4) "+B$(C(F(4))):GOSUB5070
5410 G$=INKEY$:IFG$="S"THEN5540E
LSEIFG$=""THEN5410
5420 G=VAL(G$)
5430 IF G<1 THEN 5410
5440 IF G>4 THEN 5410
5450 IF C(F(G))<>ZW THEN5480
5460 Y=186:JK$="    CORRECT: THE
ANSWER IS: "+B$(ZW):GOSUB5070
5470 CR=CR+1:GOTO5500
5480 Y=186:JK$="    WRONG: THE AN
SWER IS:"+B$(ZW):GOSUB5070
5490 IR=IR+1
5500 FOR Y=1TO3000:IFINKEY$=CHR$
(13)THEN5520ELSE NEXTY
5510 PCLS
5520 NEXT P
5530 IFCR=J THEN GOSUB 5660
5540 CLS:PRINT:PRINT
5550 J=CR+IR:IF J=0 THEN J=1
5560 PRINT:PRINT:PRINT"     NUMBE
R CORRECT = "CR
5570 PRINT
5580 PRINT"     NUMBER WRONG    =
"IR
5590 PRINT:PRINT"     STUDENT SCO
RE   = ";INT(CR*100/J);"%"
5600 PRINT:PRINT"     ANOTHER TRY
 (Y/N)";
5610 W$=INKEY$:IFW$=""THEN5610
5620 IF W$="Y" THEN RUN
5630 IF W$="N" THEN 5650
5640 GOTO5610
5650 CLS:END
5660 RETURN
5670 RETURN
5680 DATA 1,CLEVELAND
5690 DATA 2,SAN DIEGO
5700 DATA 3,INDIANAPOLIS
5710 DATA 4,PITTSBURGH
5720 DATA 5,CINCINNATI
5730 DATA 6,NEW YORK
5740 DATA 7,BUFFALO
5750 DATA 8,LOS ANGELES
5760 DATA 9,HOUSTON
5770 DATA 10,KANSAS CITY
5780 DATA 11,NEW ENGLAND
5790 DATA 12,DENVER
5800 DATA 13,MIAMI
5810 DATA 14,SEATTLE
5820 DATA END,END
```

TIP

want to see the only package that integrates database, word processing, spread sheet, communications and graphics?

See Page 182

I/O routine and data entry modes

Rainbow Checkbook IV

By Richard White
Rainbow Contributing Editor

In this issue we will cover the I/O routine and date entry modes. In previous months, we have covered a lot of code, much in subroutines, but have not seemed to cover as many program functions as I might have wished. Now, we will move a bit faster since many of the needed subroutines are complete.

At this stage of program development, the I/O routines are particularly important. They will allow us to type in a test file once, save it, and then reload it again and again as we exercise the program to find the bugs. If you are working with a cassette, make eight or 10 copies of the test file on a tape so you don't have to stop and rewind as often.

I always put my primary I/O routines in the 900 block of lines. Save routines come first, then load routines and finally any subroutines that are used by load and save. This way there is never a need to hunt through a listing to see where these are.

```
900 CLS:PRINT@8,RC$,"      SAVE OR PRINT DATA"
    ,,,,,TAB(8)"tAPE",,,,TAB(8)"dISK",,,,TAB(8)
    "pRINTER":GOSUB1:IFI$="D"THEND=1ELSE
    IFI$="T"THEND=-1ELSEIFI$="P"THEN600ELSE900
```

Line 900 prints a menu that gives a user the choice of tape, disk or printer output. The variable D is used to carry the buffer number, -1 if tape or 1 if disk. If P is keyed for printer, the program is sent to Line 600 and no buffer number is set. The menu is user-proofed in that it starts over if any key other that T, D or P is entered. Note that spacing of lines is done using a series of commas. Each pair advances the print position one line on the screen. It's as quick and economical as any other way to advance two or three lines. We use our friendly *GOSUB1* to call the *INKEY$* routine in that line. Line 910 is all the code we need to save a file once it calls a subroutine starting at line 985, which we will examine first.

```
985 PRINT:IFD=-1THENPRINT"TAPE FILE"ELSEPRINT
    "DISK FILE"
990 PRINT:PRINT"FILENAME";:IFD=1THENPRINT
    " AND EXTENSION: ",NM$ELSEPRINT": "NM$
995 LINEINPUTI$:IFI$<>""THENNM$=I$:RETURNELSE
    RETURN
```

In Line 985, D is tested to see if tape or disk mode had been chosen and TAPE FILE or DISK FILE is printed accordingly. Line 990 then asks for the filename, prints AND EXTENTION if disk is chosen and then prints the current file name. If you are using the default extension, DAT, it need not be entered. If you had previously loaded a file, NM$ contains the name of that file. You may reuse it, that is, replace the existing file on your disk with your updated check file or save it as a new file to another disk that does not have that filename. You have essentially the same options when using tape. We have seen the method in Line 995 before where *LINEINPUTI$* asks for a string. Only if characters are entered are I$'s contents assigned to NM$. By the way, I use *LINEINPUTI$* here so disk users can enter a drive number if they want. For example, to call a file call *TEST/DAT* in drive one, *TEST:1* can be entered. *INPUT* treats the colon like it does a comma and figures that the

---

(Richard White has a long background with microcomputers and specializes in BASIC *programming. With Don Dollberg, he is the author of the* TIMS *database management program.)*

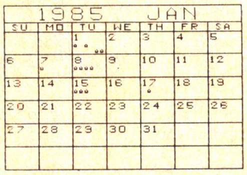
Custom Software Engineering, Inc.

807 Minutemen Causeway (D-2), Cocoa Beach, Florida 32931
(305) 783-1083

For information or technical support, please call between 5:30 and 8:30 P.M. Eastern time.

GET ORGANIZED IN 1985

DATE-O-BASE CALENDAR puts YOU in charge of your schedule!



1985 JAN

SU	MO	TU	WE	TH	FR	SA
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

- Graphically displays any monthly calendar between 1700 and 2099. You put in up to twelve 28 character memos per day...calendar shows where the memos are...call up of day shows details.
- Use for appointments or a log of past activity.
- Search capability allows you to list or print all memos between two specified dates or only ones meeting key-word criteria.
- Date computation shows elapsed time between two dates in days, weeks, months and years.
- Requires 32K in BASIC

TAPE DATE-O-BASE CALENDAR - $16.95 (max. 400 memos/tape file)

DISK DATE-O-BASE CALENDAR - $19.95 (over 4000 memos/disk...max. 300 memos/month)

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

DISK DOUBLE ENTRY

If you have spent hours trying to balance your Debits and Credits, DISK DOUBLE ENTRY is for you!

- Designed for small business, club and personal use.
- Enter transactions in a journal type format. Program will maintain current account balances, produce Trial Balance, Income, and Balance Sheet reports and complete Account Ledgers.
- Will handle up to 300 accounts including report headings and totals.
- Up to 1400 average transactions on a diskette.
- Summary reports and four levels of subtotals available.
- Requires 32K and an understanding of standard double entry accounting concepts.

$44.95 in BASIC with Machine Language subroutines.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

STATEMENT WRITER

For use with (and requires) Disk Double Entry

- Produces statements suitable for billing from your Receivables accounts.
- Provides mailing labels to use with your statements and account summaries.
- Designed and documented to allow you to change formats to accommodate your own special needs.

$34.95

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

That's INTEREST-ing

Let your computer do some REAL computation!

- Helps you solve problems dealing with time, money, and INTEREST!
- AMORTIZATION TABLES any way YOU want them...even lets you change any terms mid-schedule!
- Calculates Present Value, Future Value, Capital Recovery for any combination of payments you specify.
- Rate of Return computation predicts how hard your money will be working for you!
- Computes Bond yields...current and to redemption.
- All answers available on screen or printer.

$29.95 in BASIC

GRAPHIC SCREEN PRINT PROGRAM

Works in all PMODES and lets you shift screen image anywhere on the printed page.

- Relocatable code lets you use all of your 16K or 32K machine.
- Available in Color Basic 1.0 and 1.1/1.2. Use EXEC 41175 to see which you have and SPECIFY WITH ORDER.
- SPECIFY PRINTER TYPE...in Machine Language

$7.95 - TRS-80® LP-VII/VIII & DMP 100/200/400/420

$9.95 - Epson GRAFTRAX®, NEC® PC 8023 A-C, IDS 440/445, Paper Tiger® 460/560, Micro Prism® 480, Prism® 80/132 (with dot plotting), TRS-80® DMP-120, DMP-110, TDP-1, PROWRITER® Centronics 739, Microline® 82A/83A (with Okigraph 1) /84/92/93, Star Micronics, Inc. GEMINI 10/10x/15 and Gorilla Banana (Trademarks of Tandy Corp., Epson America, Inc., C-Itoh, NEC America, Okidata Corp., Integral Data Systems, Inc.)

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

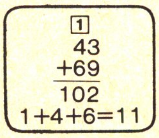
ALPHA-DRAW

Works great with GRAPHIC SCREEN PRINT PROGRAM!

- Subroutine designed to let you add any keyboard character to your graphic displays.
- You define X and Y coordinates and a string variable of one or more characters...ALPHA-DRAW does the rest!
- BONUS - includes instructions for a true line-numbered merge of tape files.

$8.95 in BASIC

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★



```
   1
   43
  +69
  102
1+4+6=11
```

HELP YOUR CHILDREN HELP THEMSELVES

MATH TUTOR

- 5 Programs in 1...ranges from simple addition through long division with 4 levels of difficulty.
- Requires regrouping to be shown...provides for trial quotients in long division.
- Shows how to correct errors...step by step approach stresses accuracy.

$13.95 in BASIC

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

SPELLING TEACHER

- Teaches students their own word lists...tape or disk files hold up to 200 words each.
- Suitable for any level from kindergarten to college.
- Misspelled words are retaught to reinforce correct spelling.
- Words presented in 4 lively formats - study, scrambled word game, trial test, final test.

$12.95 in BASIC

ALL PROGRAMS require Extended Color Basic and are delivered on cassette. All, except Tape Date-O-Base Calendar, are DISK System compatible.

U.S. and CANADA add $1.00 per order for shipping. Overseas $2.50 per order. All prices in U.S. dollars. Florida residents add 5% sales tax. Return within two weeks if not completely satisfied.

RAINBOW CERTIFICATION SEAL

ALL LISTED PROGRAMS

MasterCard

For VISA and Master Card orders: Include type, account number, expiration date, signature and phone number. Sorry! No COD's.

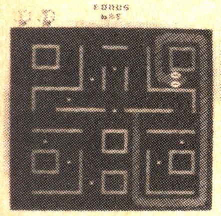
VISA

NOVASOFT™

★ A TOM MIX COMPANY ★

AT LAST!

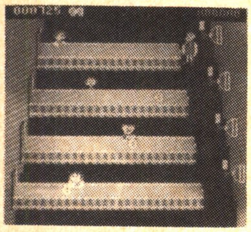
TOP QUALITY SOFTWARE AT AFFORDABLE PRICES! WRITTEN BY WELL-KNOWN AUTHORS IN 6809 MACHINE LANGUAGE ESPECIALLY FOR *NOVASOFT*™



BUZZWORM

This one will drive you nuts. Guide the snake around the screen eating the snakebait for points; but don't bite yourself! Lots of fun awaits you with this one.

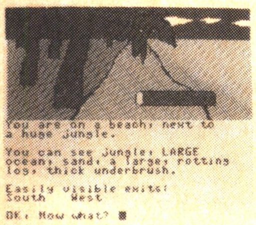
REQUIRES 32K & JOYSTICK
TAPE $15.95
DISK $18.95



BREWMASTER

Move along the end of the bars serving beer to your thirsty customers. Watch for falling glasses and rowdy customers. Loads of fun.

REQUIRES 32K & JOYSTICK
TAPE $14.95
DISK $17.95

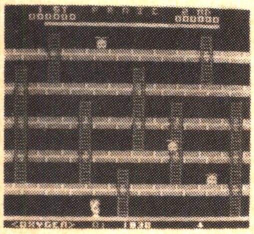


```
You are on a beach, next to
a huge jungle.

You can see jungle, LARGE
ocean, sand, a large, rotting
log, thick underbrush.

Easily visible exits:
South   West

OK, Now what? ■
```

BLACKBEARD'S ISLAND

A brand new high res graphic adventure. This one will blow your socks off! Wander around Blackbeard's Island being ever mindful of the hazards while your lust builds for Blackbeard's buried treasure. T'aint easy, matey!

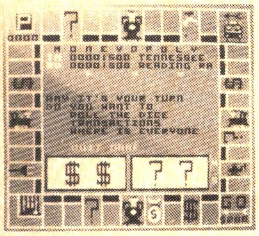
REQUIRES 32K DISK ONLY
DISK $19.95



PANIC

Climb the ladders and fight the "meanies". Dig holes and bury them. Hours of fun await you in this outstanding graphic arcade game. Enjoyment for all ages.

REQUIRES 32K & JOYSTICK
TAPE $14.95
DISK $17.95

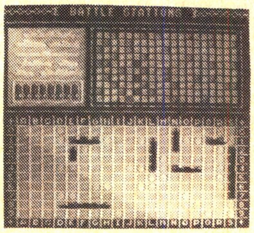


```
M O N E Y O P O L Y
0000|500 TENNESSEE
0000|500 READING RR

RAY IT'S YOUR TURN
DO YOU WANT TO
   ROLL THE DICE
   TRANSACTIONS
   WHERE IS EVERYONE
```

MONEYOPOLY

Now! Play this popular board game on your computer. Probably the most realistic computer board game simulation ever. Contains all the features of the original. Buy, rent or sell properties and become a wealthy land baron with this program.

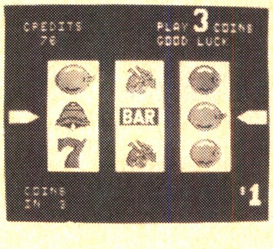
REQUIRES 32K & JOYSTICK
TAPE $19.95
DISK $22.95



BATTLE STATIONS

BATTLE STATIONS is a remake of a popular board game. Without a doubt the most outstanding sound and graphics you have ever heard or seen. **BATTLE STATIONS** is a one player interactive simulation of skill, strategy and luck. The player pits his tactical skills against the cold, cunning logic of the computer.

REQUIRES 32K DISK
TAPE $21.95
DISK $24.95

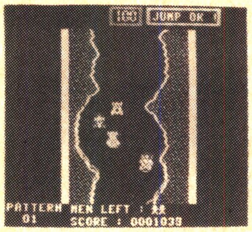


VEGAS GAME PAK

Have you ever wanted to bring Las Vegas home with you? Now you can! Six different games in this package: Blackjack, Keno, Poker, plus three slot machine lookalikes. You'll swear you are at the table or the slots when you see the outstanding graphics we have created.

REQUIRES 32K
TAPE $24.95
DISK $27.95

6 games



COLOR CAR

You asked for it and now here it is! Fast-moving Grand Prix style racing. With your computer sit at the wheel of your racer through the difficult racecourse. Smash into other cars but be careful because they'll return the favor. Jump your car through the air, over water, and other hazards.

REQUIRES 64K & JOYSTICK
TAPE $19.95
DISK $22.95

NO DEALERS PLEASE

MasterCard VISA

CHECKS OK

Phone Orders (616) 957-0444
4285 Bradford N.E.
Grand Rapids, MI 49506

*Add $2.00 shipping & handling

data following is for a second variable which has not been defined, so it sends the message EXTRA IGNORED.

```
910 GOSUB985:OPEN"O",D,NM$:PRINT#D,LR:PRINT#D,BB
    :PRINT#D,CB:FORX=1TOLR-1:PRINT#D,A$(X)
    :PRINT#D,A(X,0):PRINT#D,A(X,1):NEXT:CLOSE
    :RETURN
```

Having handled the filename matter with the *GOSUB985* call, Line 910 proceeds to open the file using the variables D and NM$. CoCo BASIC was a step forward in the simplification of file handling routines based on string or numeric variables such that the same code can address a variety of devices. Microsoft has further developed this concept in the IBM and Radio Shack Model 100 BASICS. After opening the file for output, *OPEN"O"...,* we print LR, the last record number plus one, the bank balance BB and the current balance CB so these will be at hand after we load the file. Next a *FOR...TO...NEXT* loop is used to save the data arrays *A$(X), A(X,0)* and *A(X,1).* Since LR is the number of records plus one, the loop is made to end at LR-1. The file is then closed and control returns to the calling routine.

```
950 CLS:PRINT@8,RC$,TAB(11)"LOAD DATA",,,,,TAB(8)
    "tAPE",,,,TAB(8)"dISK":GOSUB1:IFI$="D"THEN
    D=1ELSEIFI$="T"THEND=-1ELSE950
960 GOSUB985:OPEN"I",D,NM$:INPUT#D,LR,BB,CB
    :FORX=1TOLR-1:INPUT#D,A$(X):INPUT#D,A(X,0)
    :INPUT#D,A(X,1):NEXT:CLOSE:CR=1:GOSUB16
    :IFCC$="DEP"THENA(0,1)=A(1,1)-A(1,0)ELSE
    A(0,1)=A(1,1)+A(1,0)
965 RETURN
```

Loading a file back in follows the saving pattern almost exactly. Line 950 is the tape or disk choice menu. In Line 960, the file name function, file opening and data recovery are nearly identical to Line 910. The file is opened for input *OPEN "I"*. . . rather than for output. The keyword *INPUT* is substituted for *PRINT* and that's it until the code after the *CLOSE.*

You may remember that we defined an *A$(0)* array that contained the note FIRST ENTRY BELOW. This message appears when the user scrolls back to the first entry. The associated numeric arrays for amount and balance were not assigned data. While working on the editor, I realized a balance would be needed in *A(0,1)* if a new entry were inserted as the first one in the file. Further, when cleared items are stripped from the file, the first entry will change and the balance in *A(0,1)* must change. For now, calculating *A(0,1)* when a file is loaded handles the matter, particularly since the zero arrays are not saved to the file.

Note that this zero balance must be calculated in one of two ways, depending on whether the first record is a deposit or other type. For a deposit, the amount, *A(1,0)* must be subtracted from the balance *A(1,1)* to get *A(0,1).* Otherwise, it is added.

In normal operation, a load or new menu at Line 2100 sends the program to load a file and then to the input mode starting at Line 100 to perform the various inputting and editing operations.

```
100 PS=224:GOSUB50:GOSUB52:GOSUB54:GOSUB56:
    PRINT@128,STRING$(192,32):CR=LR:GOSUB12:
    GOSUB11:F1=2:GOSUB14:F1=0:CC=VAL(CC$)
```

First, a new printing position variable, PS, is defined. Next, subroutines 50, 52, 54 and 56 write the fixed text on the screen. A *STRING$(192,32)* cleans the variable data area. *CR=LR* in the expectation that the user will be entering a new record. Subroutines 12 and 11 get the data for record CR-1 and print it in the top record position. F1 is used as a flag to signal subroutine 14 to do a return after the last record variables are put into the current record variables. F1 is set to zero after the *GOSUB14.* The current record variables need to initially contain the last record values so the user can reuse these if they wish. Line 14 was changed to permit its use here so, if you have been typing along with us, you had better correct 14 now.

```
14 CC$=LC$:CD$=LD$:CA=LA:CB=LB:CS$=LS$:CN$=LN$
   :IFF1=2THENRETURN
```

Let's come back to the PS variable. When I wrote the editor code, I found that I wanted to write the current record starting at position 96 rather than at 224 as we have up to now. I found that if I changed Line 15 using PS and an offset value I could use that subroutine from both data entry and edit modes. Of course this means that PS must be set at a number of places in the program and we will point it out when it appears. In the meantime, here are the lines we discussed previously, as changed.

```
15 PRINT@PS,USINGS4$;CC$;:PRINT"  "CD$:
   PRINT@PS+12,USINGSS$;CA:PRINT@PS+23,
   USINGSS$;CB;:PRINTSTRING$(63,32);:
   PRINT@PS+32,USINGSN$;CS$;:PRINTCN$:RETURN

2130 PRINT@320,"ENTER OUTSTANDING ITEMS        ";
     :PO=224:PS=PO

110 PRINT@320,"ENTER OUTSTANDING ITEMS        ";
    :PO=224
120 PRINT@PO,"";:GOSUB1:VI=VAL(I$):
    IFFG=0AND(VI>0OR I$=CHR$(13))GOSUB60:GOTO120
```

You probably noticed the similarities between 2130 where PS=PO was added and 110, our new input mode line. Most of the 100 block is identical or very similar to the 2125-2160 block, so I will review the functions and comment only on significant differences. Line 120 tests for data input mode, FG=0 and entry of a digit or a carriage return. These conditions satisfied, it goes to Line 60 where a series of subroutine calls step through entry of a new check. If these conditions are not satisfied, control falls through to Line 130 where the I$ is tested against the string *"DAVCESLN"+CHR$(94)+CHR$(10).* The user was previously prompted for a keystroke by text printed by Line 56. Compare the function names in Line 56 with the characters in the search string in 130.

```
130 J=INSTR(1,"DAVCESLN"+CHR$(94)+CHR$(10),I$):
    IFFG=0THENONJ GOSUB62,64,66,160,200,900,950,
    400,68,18ELSEONJ GOSUB2160,2160,2160,160,200,
    900,950,400,17,18
 56 PRINT@448,"dEPOSIT aDJUSTMENT vOID cLEARED eDIT     sA
VE lOAD nEW MONTH "CHR$(94)"'S";:RETURN
```

If a match between I$ and a character in the search string in Line 130 is found, J will be assigned the character's position number in the search string. Control will be passed to one of the lines after one of the *ONJ GOSUBs*. One *GOSUB* is used from the input mode when FG=0. The other is used when in the scrolling mode to keep the user from inadvertently choosing a function that could destroy data in the file.

```
140 IFJ>4 ANDJ<9THEN100
150 IFCR=LR THEN110ELSE120
160 CS$="C":GOSUB15:GOSUB38:RETURN
```

Returning from a subroutine call in Line 130, Line 140 checks to see if the program went to a routine that changed the screen. If so, the program is sent to 100 where the input mode starts from scratch. Line 150 tests if the user has scrolled to the top of the file and should be put into input mode in Line 110 or be left in the review mode and sent to Line 120. Line 160 clears an item, reprints the entry and updates the A$(CR) entry. If you incorrectly clear an item, you can go to edit mode to correct the error.

Once the I/O and input code was finished, I could load a test file and really start exercising the program. Gone were the days when a syntax error meant retyping entries to test the program. Most of the serious errors had been found before this. At this point, the programmer becomes aware of the small details like a misspelled word or the improper location of text on the screen. A case in point was Line 11 which printed the date for the last record one space too far left. A space was added to the spacer string just before LD$.

```
11 PRINT@96,USINGS4$;LC$;:PRINT"  "LD$:
   PRINT@108,USINGSS$;LA:PRINT@119,USINGSS$;LB;:
   PRINTSTRING$(63,32);:PRINT@128,USINGSN$;LS$;:
   PRINTLN$:RETURN
```

Next I found that I was not returning to the entry mode from the scrolling mode. I thought I had that working right in the new file mode. It turned out that the Line 40 subroutine call did an LR=CR that caused confusing things to happen. The solution was to drop the subroutine call and put the proper call in Line 18 itself. The corrected line appears below.

```
18 IFCR<LR-1THENCR=CR+1:GOSUB10:GOSUB16:GOSUB15:
   RETURNELSEGOSUB10:PRINT@224,STRING$(95,32):
   FG=0:IFCR<LR THENCR=CR+1:RETURNELSERETURN
```

By the way, note the space after the *IFCR<LR*. I just cannot seem to remember to put a space between a variable and a following keyword. If the space is missing, BASIC thinks it is dealing with a long variable name and does not recognize in this case the *THEN*. Moving on, I changed the logic in Line 36 to make the balance-updating work properly. Note that there is a variable and a following keyword, *ELSE,* in this line also.

```
36 IFCC$<>"DEP"THENCB=CB-CA ELSECB=CB+CA


68 PRINT@320,"REVIEW ENTRIES          ";:
   PO=335:FG=1:GOSUB17:RETURN
```

It's a little thing, but the string of spaces after REVIEW ENTRIES in Line 68 was one short of enough to completely erase the previous printing. Nine spaces will do the job. After the I/O code was complete, the way the entry menu handled a return from loading a file to get the user to Line 100 needed work. The problem was that I wrote I/O handlers as subroutines and Line 2110 sent the program with a *THEN950,* hardly a subroutine call. Of course, if a subroutine call is used, control will be returned to the code following the subroutine call and here is where a *GOTO100* must be added to get to the input code. The corrected code follows.

```
2100 CLS:PRINT@8,"rainbow checkbook":PRINT@47,
     "BY":PRINT@72,"RICHARD WHITE":PRINT:PRINT
     :PRINTTAB(8)"lOAD FILE":PRINT:PRINTTAB(8)
     "nEW FILE"
2110 GOSUB1:IFI$="L"GOSUB950:GOTO100ELSE
     IFI$<>"N"THEN2110
```

In 2050, SN$ was changed to "% %" and CS$ was initialized to "O" instead of "OUTSTD" to provide for more note room. Also in Line 2050 was the string IS$ which was intended to be a standard string to search for I$ in an *INSTR* statement. Since I have not used it, it was deleted.

```
2050 RC$="RAINBOW CHECKBOOK":SS$="##,###.##":
     SN$="% %":CR=1:LR=1:S4$="%  %":CS$="O":
     A$(0)=" $ $ $FIRST ENTRY BELOW"


2150 J=INSTR(1,"DAVES"+CHR$(94)+CHR$(10),I$):
     IFFG=0THENONJ GOSUB62,64,66,200,900,68,18
     ELSEONJ GOSUB2160,2160,2160,200,900,17,18
2155 IFJ=5 THENGOTO100
2157 IFCR=LR THEN2130ELSE2140
```

Finally some surgery was performed on Lines 2150-2155. Line 2155 was renumbered to 2157 and a new Line 2155 added. Essentially it sends the program to the input mode when a *SAVE* is requested. Once the user has saved a file, I expect them to operate from the input rather that the new file mode. This way, return from the I/O routine is to the input mode so the user can do more work if he or she chooses. In Line 2150, the variable holding the *INSTR* value was changed from I to J to be consistant throughout the program.

The end is in sight. Three blocks of code remain; edit, print and strip cleared entries to an archive file — I call this NEW MONTH on the input menu. Edit is done, as complicated as I expected, and will be a column in itself. The printer is not written. If it's done in time, I will try to get the complete program listed in the next issue and in RAINBOW ON TAPE.

$$$$$$$$$$$$$$$$$$$$$

$ **LOWEST PRICES** $

$$$$$$$$$$$$$$$$$$$$$

IN RAINBOW, PERIOD!

Diskettes
$1.49

Gemini-10X
$259.95
If ordered with above,
PBH Interface $49.95

C-10 Tapes
39 cents

Mini-Modem
$49.95
Modem Cable $14.95

HJL-57
Keyboard
$69.95
Specify Orig, F, CoCo II

Spectrum DOS
$25
Half-Price !

64K Chips
$29.95
Set of 8 w/Instructions

All orders plus
$3 Shipping
NY Residents
add sales tax

Disk Drive 0
$249.95
Complete System

We reserve the right to limit quantities at these super prices.
ABSOLUTELY no other discounts can be applied. Expires 1/15/85

SPECTRUM PROJECTS

WEST DIVISION -

PO BOX 9866
SAN JOSE, CA 95157-0866
408-243-4558

EAST DIVISION -

PO BOX 21272
WOODHAVEN, NY 11421
718-441-2807

TURN PAGE FOR OUR NEW CATALOG

PIPELINE

RADIO SHACK has been kind enough to provide us with the following items of interest regarding the Color Computer:

- Two packages, *Graphics Pak* (Cat. No. 26-3157) and *Disk Graphics* (Cat. No 26-3251), are not recommended for use with the DMP-120 printer. However, they will work with the DMP-100, DMP-110, DMP-200, CGP-115 and the CGP-220 (black and white mode).

- Before using the *Hi-Res Screen Print Utility* (Cat. No. 26-3121), *Graphics Pak* or *Disk Graphics* with the DMP-110 printer, you *must* put the printer into elongation mode:

```
PRINT#-2, CHR$(27)+CHR$(14)
```

This allows you to print across the entire page rather than just half the width of your page.

- In order to have access to *Color Profile* from *Color Scripsit*, you must create a spool file in *Color Profile* with the print to disk option (Option 3). After copying the file onto the *Color Scripsit* disk, you may then access the file and edit it.

- Recently released is *TRS-80 Color Computer and MC-10 Programs* (Cat. No. 26-3195), by William Barden. This new book contains educational, word processing, graphics and household management programs for the MC-10 and Color Computers. Some of these programs make function calls (i.e., *COS*, *SQR* and *TAN*) which are not available under Standard Color BASIC. Therefore, CoCo owners who have not yet upgraded to Extended Color BASIC can add the appropriate subroutines which are given on Pages 287 through 290 of *Getting Started With Color BASIC*. MC-10 owners will not have to make any modifications.

- Radio Shack has an upgrade available for OS-9 users: OS-9 Version 1.01.00 (Cat. No. 700-2330, $14.95). This new version has added new display control codes for the video display. It also has a driver for the Deluxe RS-232 Program Pak and allows those in Europe to patch their clock module to 50 Hz.

- The OS-9 C-Compiler (Cat. No. 26-3038) requires a *minimum* of two drives. C programs must be entered in lowercase using the OS-9 editor. Each file to be compiled must reside on the Library disk. If you need more information on compiling C programs, detailed information can be requested from Radio Shack.

- If you want to be in lowercase mode when booting up on OS-9, put the following command in your STARTUP file:

```
TMODE .1 -UPC
```

- Color Computer owners who want a white Drive 1 for their white Color Computers may purchase the External Drive 3 for the Model 4 (Cat. No. 26-1161).

- If anyone is having a problem with the *Template* program (Appendix E) in the owner's manual for the X-Pad (Cat. No. 26-1196), check the following line:

```
380 ON S GOSUB 2900, 2900, 530,
780, 2900, 2900, 2900, 2900, 2900,
2900, 2900, 890, 2900, 2900, 2900,
2900
610 PMODE 3,1
1560 IF X<=0 THEN 1600
1600 IF Y<=0 THEN 1640
1810 B=5:C=8
```

If your lines differ from the ones above, please *EDIT* them and resave the program to cassette.

Note: The X-Pad is *not* compatible with the Color Computer 2 for the same reason that the old gray drives will not work with the CoCo 2. The Multi-Pak Interface will solve these incompatibility problems.

* * *

ACROSS THE SPECTRUM. Spectrum Projects, of Woodhaven, N.Y., and San Jose, Calif., has announced the appointment of Derby City Software as its new Southern Division Distributor. Derby City Software's address is 3141 Doreen Way, Louisville, KY 40220; phone (502) 458-6690. In Canada, call 1-800-361-5155.

* * *

WHAT'S TO LOSE? The 1985 Publications Catalog of the Computer Society of the Institute of Electrical and Electronics Engineers, Inc. (IEEE) (whew!), has just been published. Featuring the latest 200 titles on a wider variety of subjects and applications in computer science and engineering, this 24-page booklet details over 45 of the best selling tutorials (categorized by subject), and nearly 60 conference records and proceedings which have been published since the 1984 version of the catalog.

Copies of the 1985 catalog are available, free of charge, by writing to: IEEE Computer Society Press, 1109 Spring Street, Suite 300PR, Silver Spring, MD 20910.

* * *

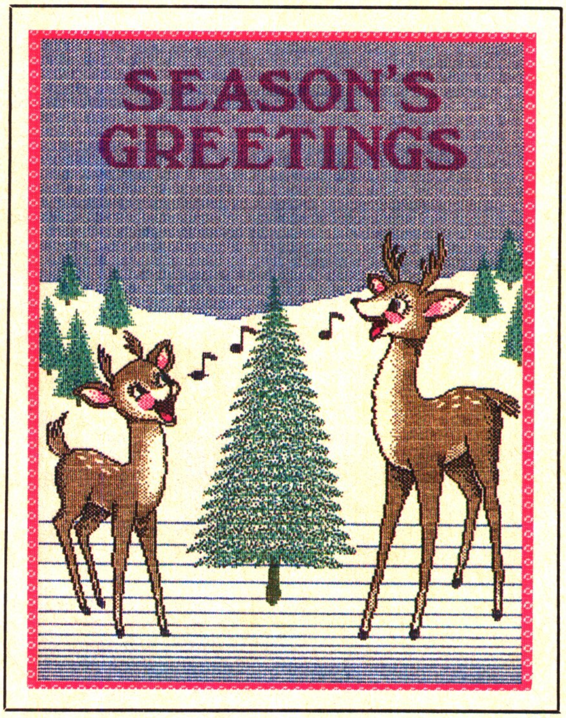
REALTORS ONLINE. A new nationwide marketing and information exchange service has been established for the real estate industry and is connecting the members of more than 100 marketing groups via their personal computers.

Exchange Network of Palm Beach Gardens, Fla., utilizing General Electric's 750-city, worldwide telecommunication system, has formed a marketing network that allows users to buy, sell, exchange, finance and transfer real estate nationally by using their own computers.

Membership to the Exchange Network is available on an individual basis to real estate licensees. For further information, write the Exchange Network, Inc., Suite 206, 4360 Northlake Blvd., Palm Beach Gradens, FL 33420; phone (305) 694-1280.

32K
ECB

CoCo Season's Greeting Cards



By Francis S. Kalinowski

Would you like to amaze and please your friends with computerized multicolor season's greeting cards next Christmas? Surprise! You can do it easily.

Here is a CoCo program that prints personalized cards in five colors on continuous fanfold sheets. It can print on any Epson printer with Graftrax-Plus (including the FX-80), and on Gemini-10X or -15X printers. You'll have to handle the paper, change color ribbons, then fold and trim the individual cards. I'll tell you exactly how to do all that. Your CoCo, my program, and the printer will do the rest. With color ribbons available for Epson and Gemini printers, you just can't pass up an offer like this.

The card program requires 21970 memory bytes for program storage plus 2650 bytes for strings and variable records. The program runs in a 32K Extended Color BASIC CoCo tape or disk system cleared to one graphics page, using *PCLEAR 1.*

Displayed prompts ask for number of cards requested, sender's name, and card-printing credit name. The program puts both names on each card during printout. You may choose to print up to 25 cards in one printing session. Figure 1 shows a printed card sheet ready for folding and trimming. Fold and trim lines do not appear on printed card sheets.

I sketched the card's cover art on a layout sheet then turned it upside down for coding. Cover art prints inverted in the fanfold sheet's upper-left quarter while greeting text portions print normally in the lower-left quarter during five color print runs. A sixth print run, with paper strip ends reversed, prints the card credit. You may use any color for the credit print run.

I used direct coding for dot-graphics similar to that described in my Graftrax art palette article (*80 Micro* Nov. '83). Briefly, two-character string codes represent most of the 256 printable dot-column patterns, similar pattern groups, and printer mode control commands. I did not define codes for 83 of the 90 ASCII values from 32 through 122. When needed in a printing statement's graphics segment, I use an undefined dot-column pattern's equivalent ASCII value character within quotation marks.

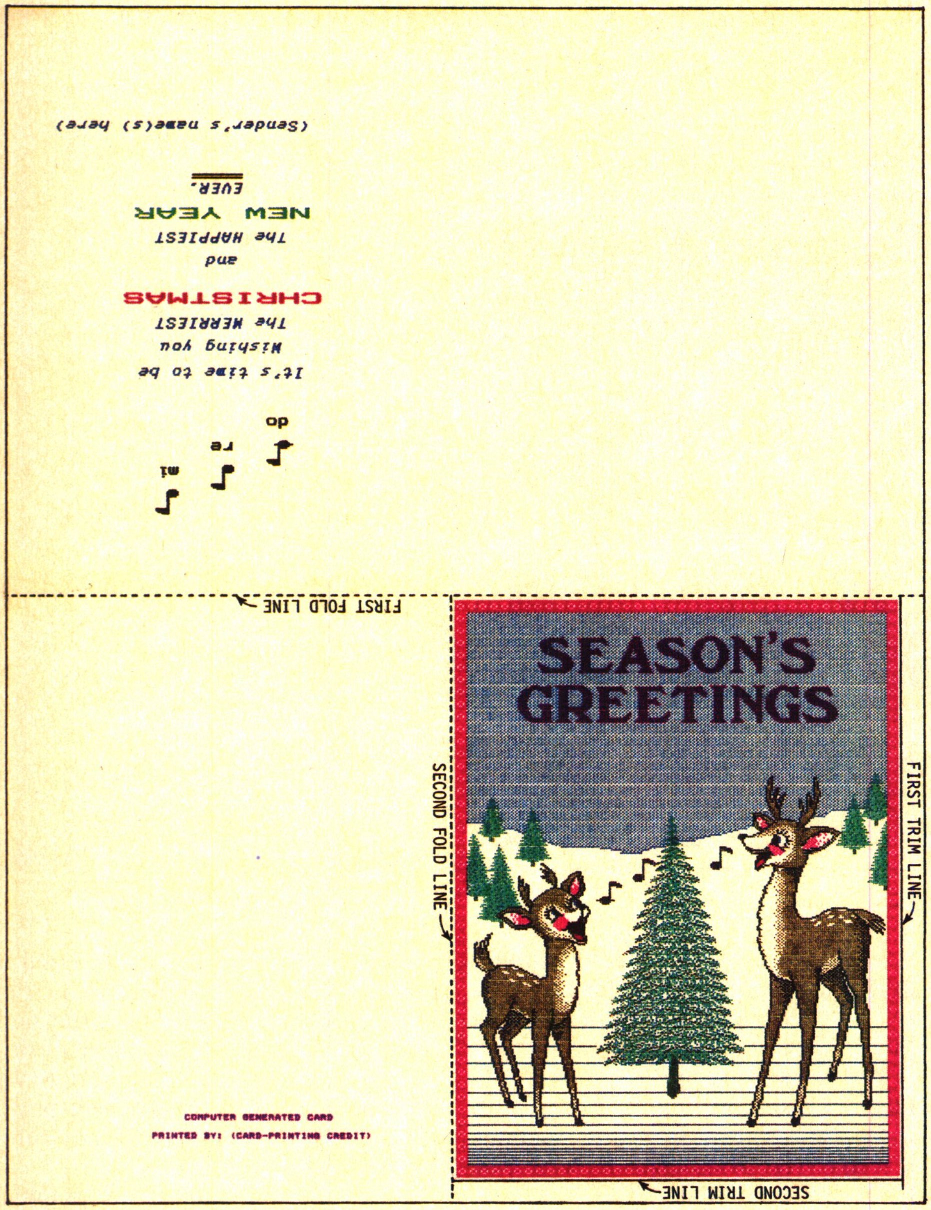
Single-letter strings A$ through N$ represent some dot-column pairs to

---

(Francis S. Kalinowski is a retired commercial and military electronics equipment handbook technical writer [21 years]. He has had several home computer articles and programs published in various computer magazines.)

simplify coding in 960-mode (double density) graphics segments. Program Lines 9060-9200 define the above global string codes. Other single-letter string codes represent multiple code patterns used several times during a color print run. I define these local codes in each color print run statement group's first line.

Figure 1:



Direct coding allows *FOR...TO* loops and *GOSUB* routines to repeat identical parts of card art. These functions reduce coding and memory requirements. Since direct coding also eliminates the normally used and relatively slow *READ...PRINT* data loops, it speeds up graphics printouts.

Gemini-10X printing time per card is about 9¾ minutes at 4800 Baud. An Epson FX-80 prints cards about five percent faster at the same Baud rate. MX-80 print time per card is about 13½ minutes at 600 Baud. I made the time checks with printers operating in normal speed mode for graphics. Printing times do not include paper and ribbon handling operations.

Program Description

The card program has three functional sections. A top section displays run instructions and in-progress messages, initializes the printer for each print run, and has common *GOSUB* routines usable in all color print runs.

A middle section contains dot graphics printing code sequence groups for all color print runs. Each group's first statement line specifies the color used, defines local string codes for the run, and starts a card counter.

A bottom section defines global string codes for dot graphics. It also displays an introduction, starting prompts, and instructions for the first color print run.

Remark Line 1 identifies the program and specifies the equipment needed to print continuous cards. Line 2 clears the screen and additional string space, identifies the starting print color, then jumps to title and coding routines.

Lines 9000-9020 display the program introduction and a printer power on/off caution. The display persists while Lines 9060-9200 define the string codes for dot-column patterns, frequently used pattern groups, and printer mode control commands. Line 9200 also displays a "Press space bar to start" prompt, then *EXEC44539* waits for the user's key press.

Line 9210 asks for the number of cards wanted (NC) then tells how many fanfold sheets are needed. Line 9220 asks for the card's signature name (*NC$*) and calculates a tab value (*NX*) for printing the signature flush-right below each card's multicolored greeting text. Line 9230 asks for a card-printing credit name (*PC$*). Line 9240 calculates a tab value (*CX*) for centering the credit on each card's back page.

Lines 9250 and 9260 display instructions to insert, align, and index mark the fanfold paper strip. Line 9260 also displays a start prompt, then sends control to the first color print run's statement group, starting at Line 1000.

Line numbering within the color print run statement groups is very irregular for good reasons. The first digit identifies the print run. The second and third digits roughly identify sketch layout sheet and color copy print lines to simplify program debugging. The fourth digit allows several statement lines of code for very long or detailed dot-graphics print lines. Also, where practical, I use multiple statement lines to conserve memory — each line number used takes five bytes.

Multiple statement Line 1000, for example, defines the print run color (*CY$*), then loops through Lines 70 and 75. Line 70 waits for a start-print key press. Line 75 clears the screen, displays a "Now local coding and printing red color" message, sets the printer for dot-graphics line spacing (*LY$*), and returns control to the calling statement.

Now Line 1000 defines three local string codes (*R$*, *O$*, and *Q$*) for reuse during the red print run. *R$* defines a six-column pattern for the card cover's border. *O$* is a complete graphics segment that prints one *R$* border pattern. The line's *FOR...TO* loop counts the cards being printed. A loop through

Line 3 displays a card in progress number after each increment of the card counter.

GOSUB19 prints the inverted card art's upper border. *T=18* specifies a number of print lines to receive left and right border *R$* patterns; *GOSUB21* prints them. *GOSUB23* prints a left border pattern on the 20th print line, then Line 1000's *PRINT#M* graphics segment colors the small deer's lower mouth area red, and adds a right border pattern. Another *GOSUB23* prints the 21st line's left border.

Lines 1210-1280 similarly print border patterns and deer head red details down through the 30th print line. From that point, *T=7* and *GOSUB21* print seven more pairs of border patterns. Lines 1370-1440 print more border patterns, the card's title in three-line high letters, and the lower border.

T=24 and *GOSUB10* in Line 1440 advance the paper 24 lines for printing the emphasized, double-width CHRISTMAS in the card sheet's lower-right quarter. Code *EC$* form feeds the paper to the next sheet's start point. Finally, *NEXT CN* increments the card counter, starting another red printing sequence within Line 1000.

When the last card (sheet) is printed, Line 1440 loops through 90 and 91, ending the red color print run. Line 90's *AR$"E"* codes disable the printer's paper-out sensor, then *EC$* does an extra form feed. Disabling the paper-out sensor lets the printer move the fanfold paper strip's tail end clear of the print head. Line 91 moves the print head for easier ribbon change.

Control drops to Line 2000 for the next (brown) print run. A loop through Lines 35-75 displays new instructions and reinitializes the printer for dot graphics. Line 2000 then defines four local string codes, starts a card counter, and does four line feeds. Lines 2050-2310 print the card's brown details. Lines 3000, 4000, and 6000 similarly start blue, green, and black color print runs.

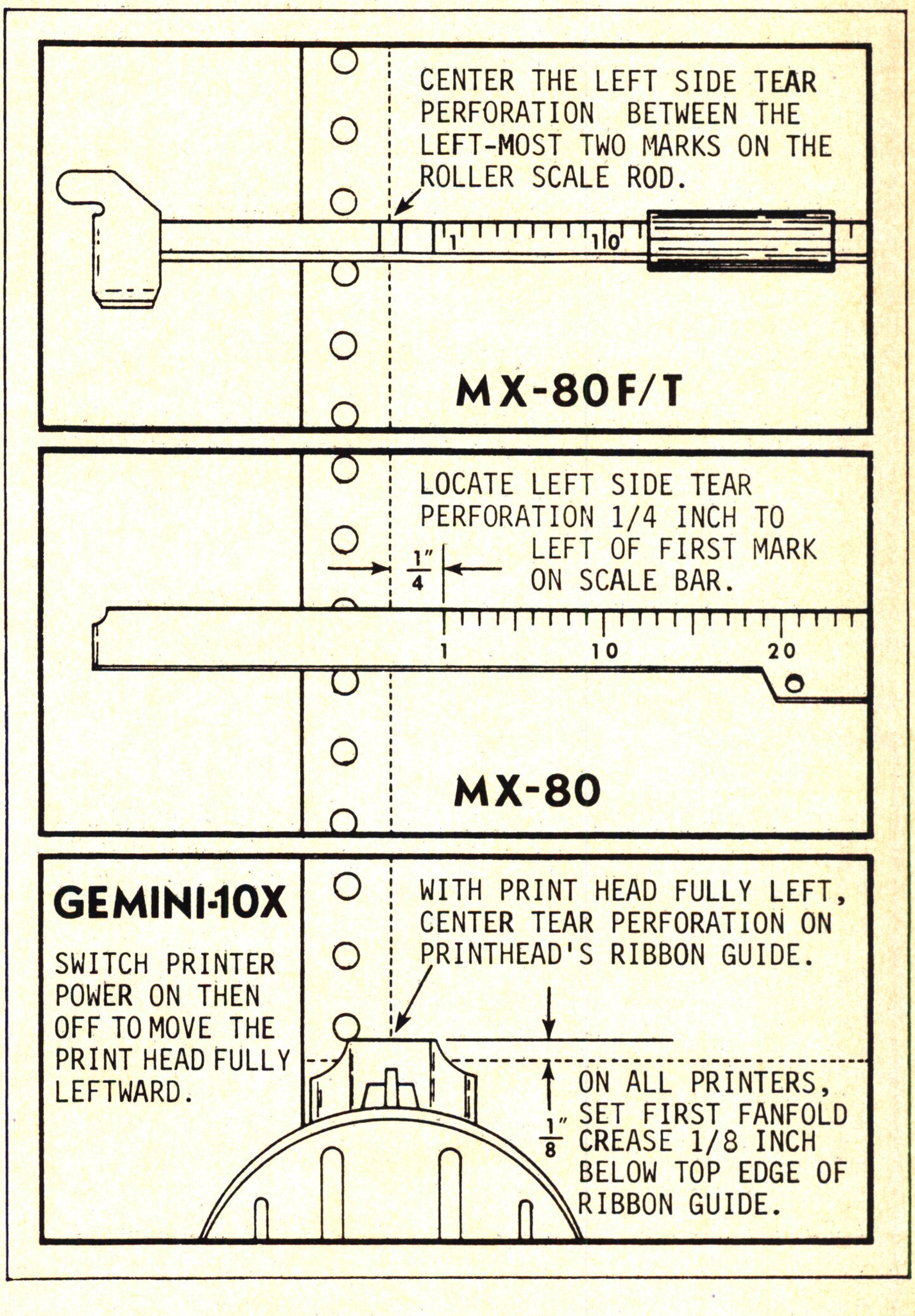
Credit print run starting at Line 7000 alters instructions to include paper strip reversal and start point adjustment. Line 7000 also resets the printer's line spacing to $^{1}/_{6}$", then line feeds the paper 56 times. Line 7020 starts a card counter and sets the printer to subscript character mode. Line 7030 prints the card-printing credit lines, form feeds, and increments the card counter for each card. Finally, Line 8990 displays a "Cards Done" message when the last greeting card's credit lines are printed.

Many color print run statements call *GOSUB* routines to print specified quantities of column patterns or identical dot graphics segments. Line 20's routine, for example, overprints the large tree's sparse brown and blue texture patterns with T-specified quantities of green random columns patterns, ranging from ASCII 152 to ASCII 255. Three-line *GOSUB* routines print identical large letters in the card's title during the red print run. Lines 2-4 print the three S's, 6-8 print three E's, 11-13 print two G's, and 16-18 two N's. Blue sky overprinting subsequently darkens the title to purple.

Hints and Precautions

Type the program exactly as shown in the listing. Every character and space is significant. The CoCo demands a space or qualified delimiter before a key word. Omissions trigger Syntax Error messages with the faulty line numbers. Fortunately, the numbers simplify error location and correction.

Figure 2:


CENTER THE LEFT SIDE TEAR PERFORATION BETWEEN THE LEFT-MOST TWO MARKS ON THE ROLLER SCALE ROD.
1
10
MX-80F/T
LOCATE LEFT SIDE TEAR PERFORATION 1/4 INCH TO LEFT OF FIRST MARK ON SCALE BAR.
1/4"
1
10
20
MX-80
GEMINI-10X
SWITCH PRINTER POWER ON THEN OFF TO MOVE THE PRINT HEAD FULLY LEFTWARD.
WITH PRINT HEAD FULLY LEFT, CENTER TEAR PERFORATION ON PRINTHEAD'S RIBBON GUIDE.
1/8"
ON ALL PRINTERS, SET FIRST FANFOLD CREASE 1/8 INCH BELOW TOP EDGE OF RIBBON GUIDE.

Unfortunately, the printer is not as forgiving or helpful in the dot graphics mode; it insists that you specify and provide exact quantities of dot-column codes for each graphics segment. Any code error or difference between code quantity specified and supplied disrupts the printed graphics line. And, you don't get any clues as to where the evil error lurks.

Be especially accurate when typing program line characters and spaces shown within quotation marks. Each letter, number and symbol represents an equivalent ASCII value dot-column pattern. Each space represents an ASCII 32 blank dot column. Only an exact duplicate of the listed card program ensures faultless program execution and card printout.

Note: If your keyed-in program fails to print cards correctly, *LLIST* the faulty color print run's statement lines to your printer and carefully compare them with the published listing. If all statement lines match exactly, recheck coding Lines 9060-9200. When all else fails, send me a printout of the faulty color print run statements, a copy of your bad card printout, and the model designation of printer used. Include an adequate SASE for return of your material and an answer.

Program Line 91 moves the print head to the right seven spaces for easier ribbon change on tractor feed Epson printers. For MX-80F/T and Gemini printer use, add *SC$* between Line 91's *PRINT#M*, command and spacing code *S7$*. The SC$S7$ combination centers the print head between the two plastic rollers on the printer's paper press or scale bar.

Configure your printer for an automatic line feed with each carriage return. Do this by setting your printer's line feed control DIP (Dual Inline Package) toggle switch as follows:

MX-80 internal switch SW2-3 ON (to left)

FX-80 internal switch SW2-4 ON (to left)

Gemini external switch SW2-4 ON (up)

Displayed instructions may appear long before a print run ends if your printer has a serial interface with a large character buffer. In such a case, allow enough time for print runs before responding to instructions. Play it safe by adding code *A7$* after *PRINT#M*, in Line 90. *A7$* sounds a beep tone when a print run ends. You must set an MX printer's internal DIP switch SW1-6 to ON, or an FX printer's switch SW2-2 to ON for beeper operation.

Gemini and Epson printer color ribbons are available from F.F. Skeberdis, P.O. Box 27, Fremont, MI 49412, phone (616) 924-3175. His two-spool Gemini ribbons are inked for dot matrix printer use. Write or call him for details. You may also find some typewriter color ribbons locally that can be rewound on Gemini ribbon spools. But, be careful! Several of the typewriter color ribbons I tried were over-inked or waxy and quickly gummed up my Gemini's print head.

Check your fanfold paper. If it is laser perforated, verify that its horizontal perforations will survive at least six back and forth folds without splitting. Do not use paper that fails this test.

Clean the print head before each card printing session, or dark ink deposits may contaminate your red ribbon. Fold a piece of smooth, firm paper towel into three layers and crease into a U shape. With ribbon removed, slip the paper towel's U-creased area between the print head and its ribbon guide. Wait 10 seconds and remove towel. Repeat this action with the unused part of towel until it comes out clean. Put a drop of isopropyl alcohol on the towel's U crease to dissolve thick or dried ink deposits.

Do not use a short tabletop printer stand when printing continuous cards. Paper movement around the very short turns creates uneven drag that may cause irregular line spacing. Position your printer on a table or stand so that blank paper feeds straight upward from the floor. The extra hanging sheets' weight helps keep the paper slightly taut in the print head area, especially on Gemini and Epson friction/tractor feed

The KEY-264K is here!!

DO YOU HAVE A 64K SYSTEM (OR 32K WITH 64K MEMORY CHIPS) ?? ARE YOU BEING TOLD YOU CAN ONLY USE 32K FROM BASIC ??

DON'T BELIEVE IT !! - KEY COLOR SOFTWARE brings you the KEY-264K. An exciting NEW SOFTWARE utility that allows any STANDARD 64K OR 32K COLOR COMPUTER TO ACCESS 64K RAM FROM BASIC, and with NO HARDWARE MODIFICATIONS REQUIRED!!

*** Works with CASSETTE based systems! ***   *** Works with DISK based systems! ***

The KEY-264K divides the 64K ram memory into two 32K banks or sides, each of which can be utilized independently by the BASIC interpreter, with the ability to switch instantly from one side to the other. IT'S LIKE HAVING TWO COMPUTERS IN ONE!! Have your BASIC program on one side and keep your variables on the other side, or have your main program on one side and your subroutines on the other side, or have your program on one side and use the other side for 4 additional HI-RES pages, or any combination you like. The possibilities are endless because the KEY-264K allows full communication between sides plus the ability to switch back and forth at will, all from within BASIC. You could also have different programs in each side and switch back and forth between them using simple keystrokes, even while the programs are running!! Or run them both at the same time in the FOREGROUND/BACKGROUND MULTI-TASKING mode. Don't buy that printer buffer yet! With the KEY-264K you can be printing in the background side while utilizing your computer normally in the foreground side AT THE SAME TIME!!! Debugging a program? Use either a BASIC command or simple keystrokes to instantly duplicate your program, in it's present status, on the opposite side. Switch to the opposite side later and pick up exactly where you were before!

For DISK users, the KEY-264K allows you to alternate between DISK and EXTENDED BASIC on the same side with simple keystrokes. No need to pull your controller or power down. You can be in EXTENDED BASIC on one side and in DISK BASIC on the other side and still switch back and forth and have full communications between the two sides.

The KEY-264K does this and MORE thru extensions to BASIC. No need to learn a new language! The KEY-264K adds 15 NEW COMMANDS and 1 function to BASIC, including powerful new BLOCK MEMORY MOVE and GRAPHICS VIEWING commands.

The KEY-264K works on the 64K COCO or 64K COCO-2 and on older 32K systems with "E", "F", or even modified "D" boards and requires EXTENDED or DISK BASIC with GOOD 64K MEMORY CHIPS!

ORDER YOUR KEY-264K TODAY by sending check or money order for $39.95 (cassette) or $44.95 (disk) plus $2.00 postage U.S.A. ($5.00 outside U.S.A.) Mass. residents add 5% sales tax.

MASTERCARD, VISA, OR COD
CALL (617) 779-5034

KEY COLOR SOFTWARE
P.O. BOX 360
HARVARD, MA. 01451

RAINBOW
CERTIFICATION
SEAL

printers. Also, relieve the fanfold creases' permanent set by reverse folding the paper strip for card printing.

Do not plug your computer and printer power cords into the same circuit. Power surges caused by printer on/off switching during program operation may glitch the program or halt the CoCo. Use a reliable power surge protector on your computer's power cord, or plug your computer and printer cords into different circuits.

Producing Cards

Color greeting cards require a separate print run for each color used. You'll need a continuous fanfold paper strip with a sheet for every card plus leading and trailing blank sheets. You must position the paper horizontally and vertically to accommodate the card's cover art, greetings text, and credit lines with enough blank margin for trimming after the sheets are folded. The fanfold paper strip's start point, established for the first print run, must be exactly the same for the remaining print runs. Use a 20-pound white bond paper.

Before attempting to load and run the card program, adjust your printer's tractor feed mechanisms horizontally as specified below.

On an FX-90 printer, insert a blank fanfold sheet, then move both tractor feed mechanisms fully rightward. Adjust either or both mechanisms to center their drive pins within the paper's pin feed holes. Lock both mechanisms.

On other Epson and on Gemini printers, adjust tractor feed mechanisms to position the paper horizontally as shown in Figure 2. Lock both feed mechanisms after adjustment.

Paper edge and fixed index marks provide a fairly accurate means for repositioning the paper strip's start point between print runs. When instructed during program execution, establish the index marks as follows:

Feed the paper strip into printer and engage the paper's pinfeed holes with pins of both tractor feed mechanisms.

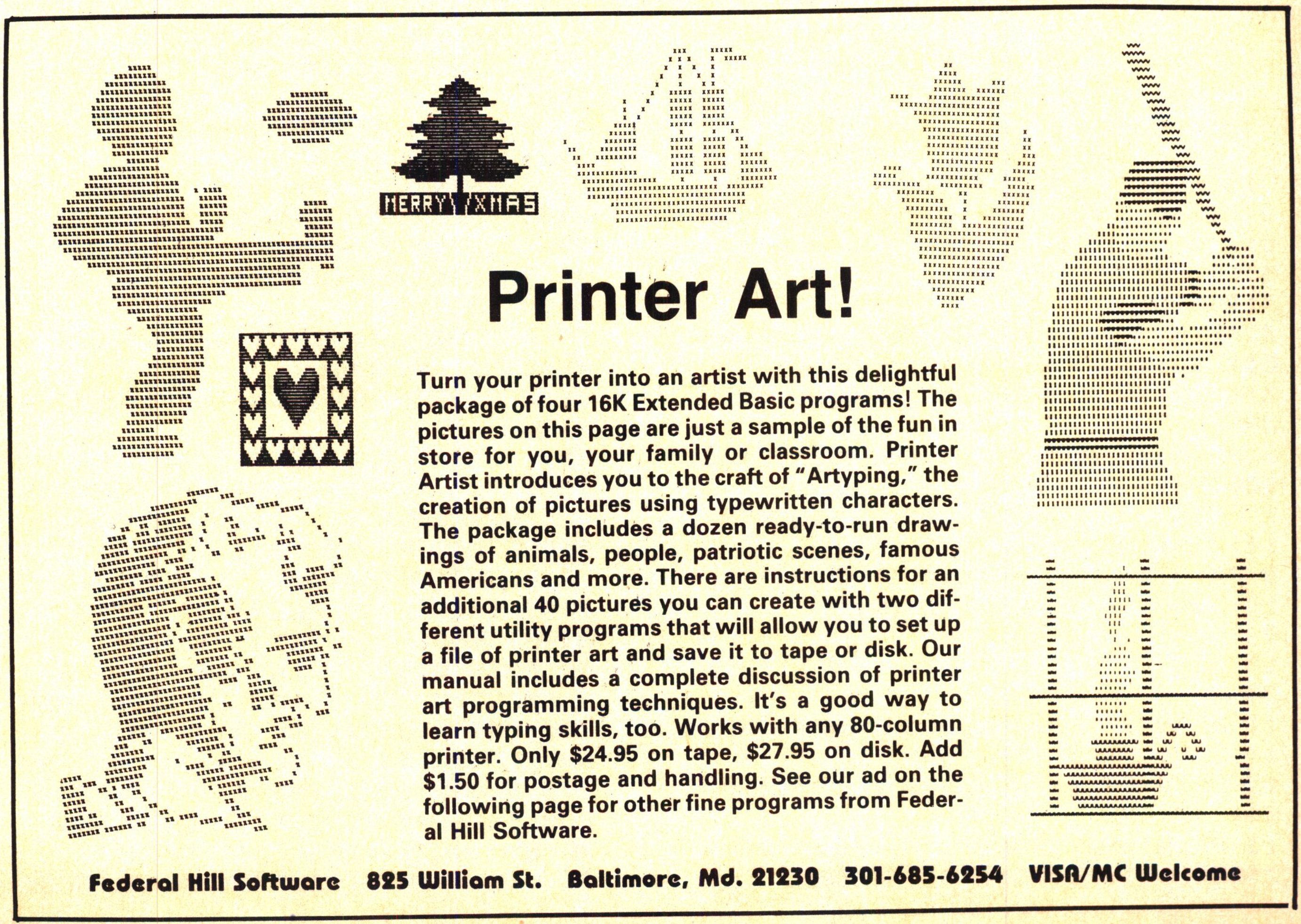
Using the printer's paper feed knob, advance the paper to position its first fanfold crease ⅛" below the ribbon guide's top edge (Figure 2).

On FX-80 printer, attach a short strip of white sticky-back label to right feed mechanism's sloping front area just outboard of the gray drive sprocket's right edge. On other printers, attach short label strip to the outer rear flat surface area on top of the right feed mechanism. Position the label strip next to or slightly under the paper's right-hand edge.

Using a fine-point pencil, draw a short straight line across the paper's edge and the fixed label strip. The two resulting marks are used as paper repositioning indexes for subsequent color print runs.

Load and start the card program. Displayed instructions tell you what to do in a specific order. The last instruction tells you to press the 'P' key to start the first color print run. Printing continues until the last card's red details are done. New instructions tell you to turn printer off, restart paper strip, insert slipsheet, change ribbon, remove slipsheet, align index mark, turn printer on, and start the next print run. Follow all instructions exactly and in the given order.

When instructed, re-insert the fanfold paper strip's start end into printer. Advance the paper until its index mark is within ¼" of the fixed index mark. Stop at that point, grasp input part of paper at both edges (just behind the paper separator), and pull it straight back slightly. Now, carefully and slowly advance the paper to exactly align its index mark with the fixed index mark. If you pass the fixed mark even a little



Printer Art!

Turn your printer into an artist with this delightful package of four 16K Extended Basic programs! The pictures on this page are just a sample of the fun in store for you, your family or classroom. Printer Artist introduces you to the craft of "Artyping," the creation of pictures using typewritten characters. The package includes a dozen ready-to-run drawings of animals, people, patriotic scenes, famous Americans and more. There are instructions for an additional 40 pictures you can create with two different utility programs that will allow you to set up a file of printer art and save it to tape or disk. Our manual includes a complete discussion of printer art programming techniques. It's a good way to learn typing skills, too. Works with any 80-column printer. Only $24.95 on tape, $27.95 on disk. Add $1.50 for postage and handling. See our ad on the following page for other fine programs from Federal Hill Software.

Federal Hill Software 825 William St. Baltimore, Md. 21230 301-685-6254 VISA/MC Welcome

bit, backfeed the paper about ½″ (don't forget the slight backward pull) and try aligning the index marks again.

The slipsheet requested in the instructions can be any piece of thin paper about four inches square. Inserted between the fanfold paper and print head's ribbon guide, the slipsheet prevents accidental color smudging during ribbon change.

Credit run instructions tell you to reverse the fanfold paper strip and insert its tail end into the printer. Feed the paper forward until its first fanfold crease aligns with the top edge of the printhead's ribbon guide. Index marks aren't needed.

When the credit print run ends, remove the paper strip, and separate the sheets at their horizontal perforations. Referring to Figure 1, fold a printed card sheet horizontally about 1/16″ above the card art's top border.

Next, make a vertical fold within 1/16″ of the cover art's left-hand border.

Place the folded card face-up on a metal or glass surface and, using a metal straightedge and single-edge razor blade or hobby knife, trim the card within 1/16″ of its right-hand border. Similarly trim the card about 1/16″ below its bottom border. Cards folded and trimmed this way fit into standard 4¼″ by 5⅝″ envelopes available at many office supply stores and print shops.

Avoid unpleasant surprises. Familiarize yourself with card printing by first trying one card, using three fanfold sheets and a worn or old ribbon.

13	90	4160	81
40	73	4270	250
1260	202	6080	105
1410	162	6120	190
2000	61	6180	84
2120	221	6230	230
2170	228	6290	112
2220	205	7000	242
2270	229	9070	176
3050	75	9110	31
3120	44	9150	251
3270	29	9190	106
3320	122	END	162

The listing:

```
1 'Christmas Card Multicolor Art
  for 32K ECB CoCo  tape or disk
  system  and an Epson Graftrax-
  Plus, Gemini-10X or Gemini-15X
  printer. Copyrighted 1984 by:
      Francis S. Kalinowski
 16 N Alder Dr Orlando FL 32807
2 CLS:CLEAR950:CY$="RED":GOTO900
0: '**** DEER XMAS CARD ****'
3 PRINT@326,"CARD"CN"IN PROGRESS
":RETURN
4 PRINT#M,Q4$"p"DS$"?"AU$AU$AE$A
E$AE$EE$H$I$HO$HG$;:RETURN
5 PRINT#M,BY$HG$Q1$R$QB$Q6$;:RET
URN
6 PRINT#M,AE$"<"HO$HG$L$L$L$L$Z5
$G0$E0$;:RETURN
7 PRINT#M,AG$AX$AV$AF$STRING$(3,
14)Z5$;:RETURN
8 PRINT#M,S1$"8"AU$AF$STRING$(6,
14)HU$H$H$AE$A2$;:RETURN
9 T=2
10 FORU=1TOT:PRINT#M,"":NEXT:RET
URN
11 PRINT#M,E0$Z5$L$L$H0$HG$DS$DV
$"?"AV$A7$A3$;:RETURN
12 PRINT#M,S1$HG$K$K$"p "Q5$E1$Z
5$;:RETURN
13 PRINT#M,Z2$HU$">"AU$AE$AF$C$A
7$AF$">"I$HO$HG$G0$;:RETURN
14 GOSUB20:PRINT#M,O$:RETURN
15 FORU=1TOT:PRINT#M,R$;:NEXT:RE
TURN
16 PRINT#M,Z3$A7$A1$Q5$E0$G0$Z3$
G0$E0$;:RETURN
17 PRINT#M,Z3$HO$HS$HU$"?"AV$AF$
A7$A1$Q1$Z3$;:RETURN
18 PRINT#M,A1$A3$Z3$Q$Q1$E0$G0$H
0$HO$HS$HU$Z3$Q$;:RETURN
19 T=39:PRINT#M,BY$HG$Q1$;:GOSUB
15:PRINT#M,R$:RETURN
20 FORU=1TOT:PRINT#M,CHR$(RND(10
3)+152);:NEXT:RETURN
21 FORU=1TOT:PRINT#M,O$SC$S8$O$:
NEXTU:RETURN
22 PRINT#M,Q2$G0$H0$HG$J$HS$DS$"
>>"E$AV$D$A7$A3$;:RETURN
23 PRINT#M,O$SB$S7$BY$"H"Q4$;:RE
TURN
25 PRINT#M,Q1$AF$"?"G$Z2$HG$L$L$
L$K$J$"<"AE$;:RETURN
26 PRINT#M,BY$HA$Q7$STRING$(129,
T)STRING$(99,T):RETURN
27 PRINT#M,BY$HA$Q7$;:RETURN
28 PRINT#M,BW$AM$Q9$Z2$K$K$K$"pp
pp00":RETURN
29 PRINT#M,BW$AM$Q1$QA$AE$AE$E$E
$E$E$H$;:RETURN
30 CLS:PRINT@10,"INSTRUCTIONS":R
ETURN
35 IFCY$="DONE"THEN8990ELSE GOSU
B30:PRINT@65,"1. TURN PRINTER OF
F.":PRINT@97,"2. REMOVE FANFOLD
PAPER STRIP.  3. PUT "CY$" COLOR
 RIBBON":PRINT@164,"IN PRINTER."
:PRINT@193,"4. REINSERT PAPER'S
START END       INTO PRINTER.
40 PRINT@257,"5. ADVANCE PAPER T
O EXACTLY           ALIGN INDEX MAR
KS.":PRINT@321,"6. TURN PRINTER
ON.":PRINT@353,"7. PRESS <P> KEY
 TO START":PRINT@388,CY$" PRINT
RUN.":IFCY$="CREDIT"THENRETURN
70 S$=INKEY$:IFS$<>"P"THEN70
75 CLS:PRINT@193,"NOW LOCAL CODI
```

Federal Hill Software

FINE PRODUCTS FOR THE COLOR COMPUTER, DRAGON AND MC-10

Mon CoCo Parle Francais! Mi Coco Habla Espanol!

These delightful 16K Extended Basic programs will teach your youngsters a basic French or Spanish vocabulary. Each language package contains two programs with a total of 1,000 words in a colorful game format that teaches children to think as well as memorize. They'll have great fun as they watch the letters hop across the screen and slip into place. Perfect for home or classroom. We include a list of the vocabulary words for study guides or lesson plans. Spanish or french, only $24.95 on tape, $27.95 on disk. Both languages only $39.95, tape or disk.

The Handicapper

Use the power of your computer to improve your performance at the track! Separate programs for harness and thoroughbred horses make it a snap to rank the horses in each race! Using information readily available from the thoroughbred Racing Form or harness track program, you can handicap a race in five minutes and a whole card in less than an hour! We even provide diagrams showing where to get the information you need.

Factors include speed, class, post position, past performance, jockey or driver's record, weight, parked out signs, beaten favorite and other attributes. Complete instructions and betting guide. Versions for all Color Computers, MC-10's and Model 100's. State computer type and memory when ordering. Harness or thoroughbred, $27.95 each, tape or disk.

NEW GREYHOUND HANDICAPPER! Now use your Color Computer for Greyhounds, too! This fine program, written by a veteran trainer, uses speed, breaking tendencies, favorite box, kennel performance, maneuvering ability and other factors to rank the dogs in each race. Recommends quinnella, trifecta and exacta bets, too. For CoCo only, $27.95 tape or disk.

SPECIAL! Any two handicappers, only $39.95. All three only $54.95.

Tax Relief!

Were your taxes a hassle this year? Then you need Coco-Accountant II. This 32/64K home and small business accounting program is everything you need to keep track of your finances and make income tax time a breeze. Use your canceled checks, credit card receipts, payroll and bank stubs. Coco-Accountant II will list and total expenditures by year, month, account and payee or income source. It tracks tax deductible expenses and payments subjects to sales tax. It even calculates the sales tax you paid.

The program offsets income and expenditures to produce net cash flow reports. It prints out a spreadsheet showing your year at a glance, balances your checkbook and prints a monthly reconciliation statement. The 32K version handles 450 entries in RAM.The 32K disk version stores 500, while the 64K tape and disk versions store an amazing 900 entries. State memory size when ordering. Only $27.95, tape or disk.

Play Blackjaq!

This lightning-fast, full casino Blackjack simulation will boggle your mind! Up to 5 players and 9 decks. The computer deals and plays vacant hands by card-counting rules! Blackjaq keeps track of winnings and losings, displays two card-counting algorithms and card distribution, and can even print out the results of each hand. Great for beginner or experienced player! Requires 16K Ext. Only $27.95, tape or disk.

Use All 64K!

Did you feel gypped when you found out your 64K computer had only 32K of memory in BASIC? We sure did. So we invented HID 'N RAM, the most powerful 64K programming tool on the market. With HID 'N RAM you can access that hidden 32K of memory from a BASIC program and use it to store and sort your data. Write a 28K program and still have more than 30K left to store numbers, names, addresses or other data. It even has a machine language sort routine! The package includes complete instructions and a demonstration program--a mailing list that holds 450 names and addresses IN RAM! Only $27.95, tape or disk.

VISA

Federal Hill Software

FINE PRODUCTS FOR THE COLOR COMPUTER, DRAGON AND MC-10

MasterCard

We accept checks, money orders, Visa and Master Card. Add $1.50 for shipping. Make foreign orders payable in U.S. funds. Credit card orders should include card number, exp. date and signature.

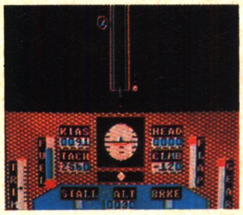
825 William St. Baltimore, Md. 21230 301-685-6254

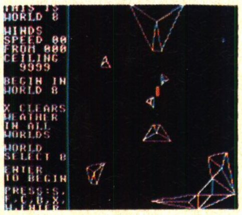
```
NG AND PRINTING":PRINT@266,CY$"
COLOR":PRINT#M,LY$:RETURN
90 PRINT#M,AR$"8"EC$;
91 PRINT#M,S7$BY$A1$Q2$:RETURN
1000 CY$="RED":GOSUB70:R$=Z1$+H7
$+GR$+GR$+H7$+Z1$:O$=BY$+A6$+Q1$
+R$:Q$=A3$+A1$:FORCN=1TONC:GOSUB
3:GOSUB19:T=18:GOSUB21:GOSUB23:P
RINT#M,"?"DV$"?"AV$AF$Q$QE$Q6$R$
:GOSUB23
1210 PRINT#M,H$HS$HO$HG$K$"p*U*U
"FA$"U*"AK$QA$Q2$A4$A2$"J"A5$"J"
A5$"J"A1$A4$A1$QB$Q5$R$:GOSUB23:
PRINT#M,QA$F0$"@"E0$QA$Q7$E0$Q1$
E0$"@"F0$AG$"@"Q1$S1$QB$Q4$R$:T=
1:GOSUB21:GOSUB23:PRINT#M,Q2$AP$
"T"FA$"Q*"AG$QE$Q5$R$:GOSUB23
1260 PRINT#M,Q4$"@"QE$Q8$R$:PRIN
T#M,O$SA$S1$BY$A6$Q1$A3$A7$AF$AV
$"?"Q1$SB$S6$O$:PRINT#M,O$S6$BY$
"$"Q3$A1$A2$A1$A2$A1$A2$A1$A2$QA
$A8$AK$"*"AL$"*"AL$"*"AL$"2"K$K$
HG$Q2$SB$S6$O$
1280 PRINT#M,O$S5$BY$"$"Q3$A8$A1
$"$"Q1$AH$"B"AG$FA$"T"F8$"T"F0$"
@"E0$QA$Q4$E0$Q1$E0$"@"E0$Q1$SB$
S7$O$:PRINT#M,O$S5$BY$"*"Q5$E0$Q
C$AQ$AL$AL$"J"Q1$A1$Q1$SB$S6$O$:
PRINT#M,O$SA$S1$BY$A6$Q2$"@ @ "Q
1$SB$S6$O$:T=7:GOSUB21
1370 GOSUB5:GOSUB25:PRINT#M,Q1$;
:GOSUB11:PRINT#M,Q3$;:GOSUB16:PR
INT#M,Q2$E0$G0$Z5$G0$E0$Q7$E0$G0
$Z5$G0$E0$Q6$;:GOSUB6:PRINT#M,Q2
$;:GOSUB6:PRINT#M,Q2$G0$H0$HG$HP
$HT$Z2$GF$E7$Q$E1$G1$Z5$G0$E0$Q1
$;:GOSUB11:PRINT#M,QB$Q9$R$
1380 GOSUB5:GOSUB22:PRINT#M,Q3$;
:GOSUB12:PRINT#M,Q2$;:GOSUB17:PR
INT#M,Q6$Z5$QA$Q1$Z5$QA$Q3$;:GOS
UB7:PRINT#M,Q9$;:GOSUB7:PRINT#M,
Q4$"?"DV$Z3$HG$G0$M$M$M$Z5$Q3$;:
GOSUB12:PRINT#M,QB$Q8$R$:GOSUB5:
GOSUB4
1390 PRINT#M,Q3$;:GOSUB13:PRINT#
M,Q1$;:GOSUB18:PRINT#M,Q2$A1$A3$
Z5$Q$Q2$HG$"x"DU$"?"AU$AU$AE$H$H
$HU$AE$AU$AU$"?"DU$"x"H0$Q3$;:GO
SUB8:PRINT#M,Q4$;:GOSUB8:PRINT#M
,Q2$H0$HO$HS$HU$Z1$AV$AF$C$C$C$Z
5$Q$Q2$;:GOSUB13:PRINT#M,QB$Q9$R
$:T=1:GOSUB21
1410 GOSUB5:PRINT#M,QA$Q2$;:GOSU
B25:PRINT#M,QA$;:GOSUB16:PRINT#M
,Q2$A3$A7$AV$"?"DV$DS$HG$L$L$HG$
DS$DV$"?"AV$A7$A3$Q1$;:GOSUB25:P
RINT#M,Q1$E0$H0$HU$Z3$H7$E3$B$B$
A3$E3$GF$Z2$HU$HG$G0$E0$Q1$;:GOS
UB6:PRINT#M,Q1$;:GOSUB25:PRINT#M
,QC$Q9$R$
1420 GOSUB5:PRINT#M,QA$Q2$;:GOSU
B22:PRINT#M,QA$Q2$;:GOSUB17:PRIN
T#M,Q3$Z5$E1$Q8$E1$Z5$;:GOSUB22:
PRINT#M,Q6$G0$HO$Z4$G7$G0$G7$GV$
Z1$HS$HG$G0$QA$;:GOSUB7:PRINT#M,
Q3$;:GOSUB22:PRINT#M,QD$Q1$R$
1430 GOSUB5:PRINT#M,QA$Q2$;:GOSU
B4:PRINT#M,Q3$A7$AF$AV$AP$AG$Q1$
;:GOSUB18:PRINT#M,Q2$G0$HG$HO$HS
$HU$">"AF$C$C$AF$">"HU$HS$HO$HG$
G0$Q1$;:GOSUB4:PRINT#M,Q7$E0$HO$
Z4$HS$HG$E0$QA$;:GOSUB8:PRINT#M,
Q1$;:GOSUB4:PRINT#M,QD$R$
1440 PRINT#M,O$SA$BY$A6$Q1$L$L$Q
2$SB$S7$O$:T=1:GOSUB21:GOSUB19:T
=24:GOSUB10:PRINT#M,TAB(52)AR$"E
"AR$"5"AE$"CHRISTMAS"AR$AK$:PRIN
T#M,EC$;:NEXTCN:GOSUB90
2000 CY$="BROWN":GOSUB35:P$=E0$+
"@ @  "+STRING$(3,16)+STRING$(3,
8):O$=A4$+STRING$(3,8)+A4$+A8$+A
G$+AG$+"  @"+E0$:Q$="U"+FA$:R$=S
2$+BY$:FORCN=1TONC:GOSUB3:T=4:GO
SUB10
2050 PRINT#M,S9$BY$AU$Q1$A7$A6$A
8$A7$QA$Q9$A7$AP$AO$AP$A6$Q2$SA$
S4$BY$AT$Q6$A7$A4$A7$A1$QA$Q6$A6
$AT$A8$A7$:PRINT#M,S8$BY$"$"Q5$A
3$Z1$A8$"#"FU$G0$QA$Q8$AF$HI$AL$
"O"HG$Q3$SA$S4$BY$AU$Q6$H0$AV$"*
"HP$A7$QA$Q6$Z1$AH$H4$"?"
2070 PRINT#M,R$GB$Q4$"?B"F8$DV$"
@"QC$Q1$AV$HA$Q$Z1$QA$Q8$"?"HA$"
U"FB$DU$E0$QC$Q9$A1$A3$AF$E$AF$A
7$QD$Q8$H0$FV$"*"HU$A3$QA$Q5$Z1$
Q$Z1$Q5$AQ$"3"A6$A1$Q4$DS$"Su"AF
$
2080 PRINT#M,R$GE$Q4$Z1$"*"EL$Z1
$QC$Q1$AV$H7$FB$CV$H0$QA$Q8$"?"G
N$FB$CV$H0$QD$Q1$HG$Z5$HS$QD$Q9$
HO$FV$DV$Z1$"?"QA$Q3$"?"Z1$DV$Z2
$Q6$H0$CV$HL$AU$A1$Q3$G0$DS$FB$H
N$AV$A1$
2090 PRINT#M,R$GG$Q3$DV$GV$FV$CV
$Z1$A1$QA$Q4$AV$"%+<"QA$Q1$DV$Z4
$QA$Q7$"?"Z3$HG$QD$Q4$Z5$QE$Q1$H
O$Z4$A7$QA$A3$Z5$Q7$E0$DS$DV$Z1$
AF$Q4$HG$Z3$AV$A1$:PRINT#M,R$GI$
Q4$Z5$QA$Q1$A7$"="HA$"U?"G0$QA$A
1$Z5$H0$QA$Q5$A7$Z4$QA$Q6$P$P$A8
$A4$A2$A$">";
2110 PRINT#M,EG$H4$HQ$HT$Q2$A3$A
4$AO$D0$"A"A2$A4$A8$O$Q2$O$QA$Q7
$HG$Z4$DV$A3$Q7$A7$Z7$Q8$H0$HU$Z
1$DV$AF$A1$Q2$E0$HU$Z3$AV$A1$:PR
INT#M,R$GK$Q5$Z4$A1$Q9$AV$HF$"W"
```

New From Tom Mix. . .

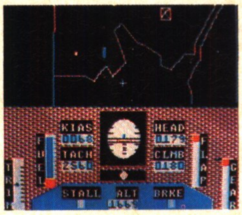
Worlds of FLIGHT

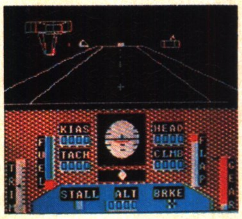
Not A Game — A Very Realistic Flight Simulation





```
THIS IS
WORLD 8

WINDS
SPEED 00
FROM 000
CEILING
  9999

BEGIN IN
WORLD 8

X CLEARS
WEATHER
IN ALL
WORLDS

WORLD
SELECT 8

ENTER
TO BEGIN

PRESS:S,
F,C,B,X,
W,ENTER
```





WORLDS OF FLIGHT (WOF) is a "view" oriented flight simulation for the TRS-80 Color Computer, written entirely in Machine Language. "View" oriented means that the pilot may determine his or her position by actually viewing the surrounding landmarks as opposed to using instruments which sense navigational references. This is a major departure from "instrument only" simulations which can be achieved through BASIC programs. Most instrument maneuvers and procedures may be practiced. The craft is a light-weight, single-engine airplane with low wings. A nose wheel which is both steerable and retractable is also modeled. Some aerobatics are possible including sustained inverted flight, aileron rolls, spins and stalls.

JOYSTICKS REQUIRED

32K MACHINE LANGUAGE

TAPE $29.95 DISK $32.95

The Experts Say:

C.L. — "As a pilot I found "Flight" to be an outstanding simulation.

M.H. — "No one has created a more realistic flight simulator for the Color Computer."

D. HOOPER, pilot for major airline — "An outstanding flying experience. Very realistic."

TOM MIX SOFTWARE
4285 BRADFORD N.E.
GRAND RAPIDS, MI 49506

•ADD $1.50 POSTAGE & HANDLING•TOP ROYALTIES PAID•
•MICHIGAN RESIDENTS ADD 4% SALES TAX•
LOOKING FOR NEW SOFTWARE
ARCADE ACTION GAMES
TO ORDER CALL 616/957-0444

MasterCard VISA

COLOR YOUR

DON'T FORGET!

Personal Time Management System and Event Recorder with Memos

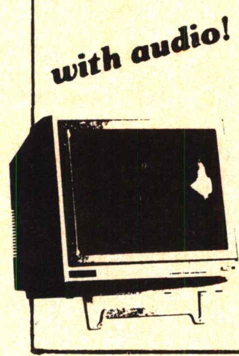
You won't forget **Don't Forget!** You'll actually enjoy getting organized with this personal time management systems. The Macintosh-like icons make entering your personal schedule simple and fun. But if you need instructions, there are help screens to assist you.

You'll never miss a birthday or important appointment again! With **Don't Forget!** you can record the entire year's occasions and daily appointments ahead. Each day has spaces for 4 Special Occasions, 2 Memos, and hourly notes for 6 am through 9 pm. The built-in 51 x 24 upper and lower case hi-res display makes it very easy to read.

You can display or print any daily schedule - or a whole week at a time - so you'll remember every important event. You can even print a blank monthly calendar page with big boxes to scribble notes in!

So use your CoCo's memory and **Don't Forget!** as your personal secretary. Designed for mouse, joystick, or keyboard entry. **Don't Forget!** requires 32K and one disk drive. **Disk $27.95**

PUT A MONITOR ON YOUR COCO WITH VIDEO PLUS!



NAP Green Screen	**$109.95**
NAP amber screen	**$119.95**
Color with audio	**$275.00**

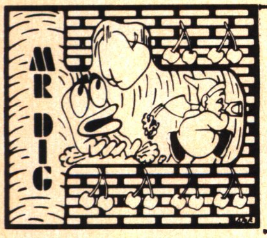
Our monochrome monitors have *audio* - no need to add expensive amplifiers or go without sound! New, improved, higher resolution model - except that by special arrangement with North American Phillips (Magnavox) ours has the *audio amplifier built in!*

Yes! You can enjoy the crisp display of a **composite video monitor** using **Computerware's Video Plus** interface. Each is fully **assembled** and **tested**. Installation is quick, easy, and requires **no soldering**. Your TV output is not disabled. **Audio output** available for color monitors. Choose the model right for your computer and monitor.

VIDEO PLUS **$24.95**
Interfaces the **original** model of Color Computer to **any** composite video monitor (color or monochrome).

VIDEO PLUS II M **$26.95**
Interfaces the **CoCo II** with a **monochrome** composite video monitor.

Video Plus II C **$39.95**
Interfaces the **CoCo II** with **any** composite video monitor (color or monochrome).



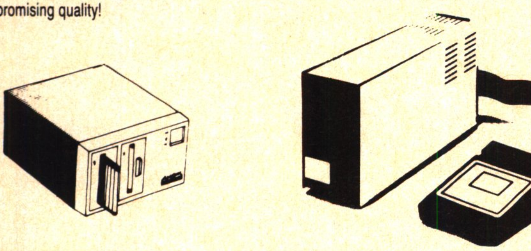
Cherry pickin', tunnel diggin', bad guy chasin', apple droppin', fast moving fun - DO it all with Mr. Dig. When all the DIGGIN's been DUG, go to a new screen of challenges! (Requires 32K)
Cass $27.95 **Disk $30.95**

CoCo Cookbook

- Can be used for ANY free-format filing system (not just recipes). Try it for periodicals and article synopsis, product reviews, real estate descriptions . . .!
- Store & retrieve a large number of recipes.
- Up to 270 recipes on a single disk using a special compression technique.
- Up to 3040 characters per recipe including title, ingredients, & instructions - all in easy to use "free form" format.
- Access each recipe by title, number, or with special keyword search (like all the recipes using "chicken!") List on the screen or printer.
- 50 recipes included FREE!
- Requires 32K and a disk drive. 32K disk **$27.95**

DISK SYSTEMS

The biggest investment you'll make in your computer system will be a disk system. It will widen your computing horizons considerably and should be chosen carefully. Computerware configures systems to include the most **reliable** components at the best prices available. We do not try to be the cheapest by compromising quality!



We offer **complete systems** assembled and tested by **expert technicians**. We've been selling disk systems since 1977 so we know what you need and we make sure you get it! We use the highest quality components including **TEAC** and **Hitachi** drives. **J & M Systems** controller, all **GOLD** connectors, **heavy duty** cabinet, power supply, and cable. Our power supplies are totally adequate to insure reliability; we know dual drives need heavier power supplies! All of our TEAC and Hitachi drives come with a **6ms** step rate, full **40 tracks, slim** line size, and a one year warranty. In addition to the DOS manual, you receive a 20-page **technical manual** documenting every detail of disk drive performance and specification.

Also available from Computerware is the new Amdisk. Compatible with Radio Shack Drive 0, it is perfect for adding extra storage. Our software is available on Amdisk format for only $4 extra. (Remember every Amdisk cartridge is equivalent to two floppy diskettes.)

DISK SYSTEMS

Include J & M Controller, DOS Manual, cabinet, power supply, half-size double density drive, & all cables. (Prices quoted for JDOS. Add $10 for RSDOS.)

Single drive, Single sided	**$349.00**
Single drive, Double sided	**$399.00**
Dual drives, Single sided	**$509.00**
Dual drives, Double sided	**$599.00**

ADD ON DRIVES

Each drive add-on includes half-sized drive(s) in cabinet with extender.

Single drive, Single sided	**$229.00**	J & M Controller	
Single drive, Double sided	**$269.00**	with JDOS	**$130.00**
Dual drives, Single sided	**$399.00**	with RSDOS	**$140.00**
Dual drives, Double sided	**$469.00**	JDOS rom and manual	**$ 39.95**

AMDISK III

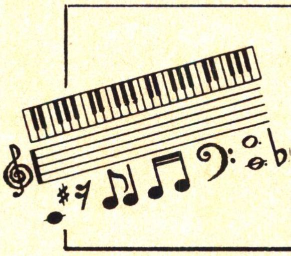
Complete Dual Drive System including controller, cable & manual. (Price quoted for JDOS. Add $10 for RSDOS.)	**$499.00**
Dual Drive and cable only.	**$375.00**

DISKETTES

Computerware double density diskettes with hub rings are of the highest quality. We love them and so will you!

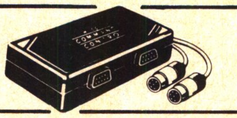
5-pack **$10.95** 10-pack **$19.95** amdisk cartridges **$5.50** each

Prices good through December 15, 1984



SYNTHER 77

With **Synther 77** you can tune your keyboard to any of a hundred different voices or instruments then play music right on the keyboard. Some users groups have formed CoCo bands, playing familiar tunes together and saving their favorites to disk or tape. The pro musicians love the technical fine tuning factors like vibrato, bender, boing, attack, sustain, and decay. While the novices can enjoy just playing along and experimenting. **Synther 77** requires 32K and costs **$24.95** on cassette or **$27.95** on disk. It will bring hours of listening and playing enjoyment to all.



ADAPTER - for Color Computer & WICO
(or any Atari compatible joystick)
$18.95

...HERE'S SOME REAL MONEY MAGIC!

THE SOURCERER

The Sourcerer is a menu driven symbolic 6809 disassembler that produces symbolic source code that can be assembled. It is compatible with most editor/assemblers including Tandy's EDTASM+, Micro Works Macro 80C, and Computerware®'s Macro Assembler. (Requires 16K)

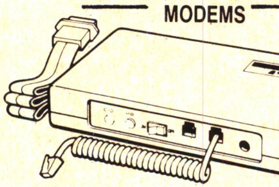
- Three modes of operation: Zap, Extended, and Full Symbolic.
- Automatic equate generation for labels and symbols outside of disassembly range.
- FCC, FCB, and FDB generation (multiple or single FCB and FDB).
- Add or change your FCC, FCB, or FDB table entries between passes.
- Written entirely in 6809 machine language for extreme speed. Disassembles any size program in seconds.
- Position independent code is relocatable to any area of memory. Leaves room for object program. Can be located in memory above $8000 if 64K available.
- User defined symbol/label buffer area for maximum flexibility.
- Produces files with or without numbers.
- Can produce symbolic labels for all extended addresses.
- Included "APPRENTICE" program finds start and end of machine language programs. Disk version also includes FIND and binary COMPARE utilities. (RSDOS Version only).
- Disassemble to disk or cassette, printer, or screen.
- Available on cassette or disk. Disk versions for RSDOS, FLEX, & OS-9.

Cass $34.95 **Disk $39.95**

• Computerware is a federally registered trademark of Computerware

HOLIDAY SEASON

MODEMS



Signalman Mark X Modem

- Auto Answer
- Auto-Dial
- Direct Connect
- Bell 103 compatible
- Hayes Smartmodem compatible
- Full or half duplex
- 110 to 300 baud
- **$159.00** including CoCo cable

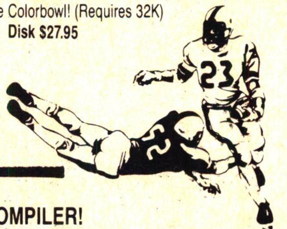
Volks Modem

- Direct connect
- Voice/Data switch
- Full or half duplex
- Bell 103 compatible
- Full or half duplex
- Requires 9 volt battery
- **$84.95** including CoCo cable

COLORBOWL FOOTBALL

Big league graphics start the football season! Two players play against each other or one can sharpen his offense against the computer. Use 8 defensive plays, 9 offensive plays, & many formations to win the Colorbowl! (Requires 32K)

Cass $24.95 **Disk $27.95**



COLOR BASIC COMPILER!

If you have ever written a BASIC program only to find that it runs too slow to provide any action and haven't had the courage to learn assembler, then the **Color Compiler**™ is the answer. It lets you write your program in easy BASIC and then converts it into fast machine language. After you run your compiled program, you may find it necessary to add some delays because the **Color Compiler**™ will make your program run an average of 40 times faster.

The **Color Compiler**™ features a total of 55 commands and functions. Most of these are a subset of Extended Color BASIC. The **Color Compiler**™ is limited to integer variables. All floating point can be done in a BASIC program which calls the compiled program. Passing information from BASIC to compiled programs is very easy. **Strings are fully supported. The Color Compiler**™ generates position independent code so that you may put the compiled program anywhere in memory, including into a ROM-pack! It requires 32K and a disk drive, leaving 16K of user work space. (Room for a program with up to 200 lines and 100 line references.)

Only **$39.95**. Complete list of commands available.

MODEM SOFTWARE

The Color Connection II converts your CoCo into a smart terminal. You can access multi-user systems like CompuServe, Videotext, and the Source – or single-user bulletin board systems – or just connect two CoCo's together.

The Color Connection II for RSDOS and Cassette

- 300 baud.
- Supports auto-dial.
- Full and half duplex.
- Menu driven – easy to use.
- Buffer size (for uploading and downloading) is shown on the screen.
- Reads and writes standard ASCII text files.
- Upload and download protocol is user definable.
- Single key "macros" (often called programmed function keys) allow entry of often used passwords and IDs with a single key.
- All printable characters available at the keyboard and all control characters are supported including ESCape, RUB, DEL, etc.
- User selectable anti-truncation features which will not allow a word to be broken when wrapping from one line to the next.
- User selectable inverted screen – for either black letters on a light screen or light letters on a black screen.
- Includes our "Introduction to Data Communications" tutorial at no additional charge.
- Choice of 51 x 24 or 32 x 24 screen display.
- Requires 16K on cassette or 32K on disk.

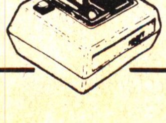
Cass $34.95 **Disk $39.95**

COLOR CONNECTION II FOR OS-09

Computerware unveiled Color Connection II for OS-9, a full-featured communications package written by renowned OS-9 author **Brian Lantz**. This package adds a whole new dimension to telecommuncations and OS-9 with features like:

- The **12-page on-line screen display** lets you view the last 12 screens even while the software is receiving new data.
- **XON/XOFF** software handshaking is supported.
- **300 baud** supported.
- **expandable buffer** allows you to save anything on the screen to memory.
- The **OS-9 shell** is accessible – within Color Connection II you can invoke any OS-9 command.
- Supports **auto-dial; full and half duplex**.
- Completely **menu** driven.
- **Upload and download** protocol is user definable.
- Single key "**macros**" allow often used sequences to be entered with a single key stroke.
- All printable characters are available at the keyboard.
- User selectable anti-truncation will not allow a word to wrap two lines.
- Reads and writes standard ASCII text files.

Only $49.95



Kraft Joystick **$29.95**

NEW

DATA BANK FOR OS-09

If you want a data base that does it YOUR WAY, then DATA BANK is the data management system for you! With DATA BANK, you are the boss. You define your own display screens, record formats, calculated fields, sort sequences, selection criteria, and report formats. Even with all its power, Data Bank is very easy to use! It goes several steps beyond the average data base by adding features like calculated fields, three level sorts, easy interface with DynaCalc, and special file manipulation utlities.

STORING YOUR DATA — the way YOU want to see it!

Remember, with Data Bank you determine how your information is stored and displayed. You can design up to 9 different screen formats for display, making data entry and retrieval simple. Each record can contain up to 512 characters in up to 35 fields, ample for nearly every application. Data types include alphanumeric (for strings of all kinds), math (for real numbers), date, and "derived" (values calculated by your own defined formulas)! These derived formulas can use values from other fields and mathematical functions. There isn't anything you can't store with these formats! The size of your data base is limited only by our disk space; and you can maintain multiple data bases on the same disk. Expansion of record files is made very easy with sophisticated file manipulation utilities. You can also transfer data between files – all records or selected subfiles, which is handy for revising record layouts!

SORTS & SELECTIONS — organizing your data

To aid in sorting and selecting, you can define up to 9 different "access keys," each with up to 3 levels. These access keys are used for accessing a specific record, sorting an entire file, or selecting subsets of files. The generic search will find any occurrence of a given value in a key field throughout the data base. Using logical operators (less than, greater than, equal, or, and) you can select any subset of your data base for printing. All or any selected subset of records can be sorted in order. You can organize your data in any way you can think of!

REPORTING — all the right stuff!

Printing your information in a format useful to you is the most important function of a data base system. Data Bank allows you to design customized reports to fit your individual needs and can save up to 9 defined formats for repeated use. You may include page headings with titles, automatic page numbers, column headings, totals for numeric fields, and more. Reports will print to the output path you specify and use any of your pre-defined access keys. **Disk $79.95**

SPECIAL FEATURES

Data Bank offers even more with:

- Access to all OS-9 commands from the program.
- Reads DynaCalc OS-9 files.
- Easy access to user programs.
- Easy expansion of record files.
- Sophisticated file manipulation.

TEXTOOLS FOR OS-9

Noted OS-9 programmer and author Brian Lantz joins Computerware to offer this impressive group of OS-9 utilities for manipulating text files. They are especially powerful because they use meta characters! Review the list of powerful commands that follow and you will see why every OS-9 user will be adding the Textools to his library. You'll see similar "Unix-type" commands from other companies with prices of up to $50. But why pay more than Computerware's **$29.95** when you can get top quality from the real experts? Order the OS-9 Textools today! (Detailed description available.)

CAT FGREP LOWER LS PACK PR QSORT
RPL SPLIT TAIL TIME TR UNIQ UNPACK
UPPER USP WC

Call or Write to:

COMPUTERWARE®

(619) 436-3512

Box 668 • Encinitas, CA • 92024

Name ____________________

Address ____________________

City ____________________ State ________ Zip ________

Yes! Send me your FREE catalog! ☐

VISA MasterCard Check COD

Card # ____________________ Exp. ________

Signature ____________________

Item	Format	Price

Shipping:
Surface — $2 minimum.
2% for orders over $100
Air or Canada — $5 minimum.
5% for orders over $100
Checks are delayed for bank clearance

6% Calif. Sales Tax	
COD Add $3	
Shipping*	
TOTAL	

```
FF$"x"EØ$QA$Q1$Z6$QA$Q4$A3$"?"Z4
$GØ$QA$P$P$"@ @ @ @ "O$O$O$O$QA$
Q4$Z6$"?"A3$Q4$;
2120 PRINT#M,A7$Z7$QA$Q1$HØ$Z3$"
?"A7$Q2$HØ$Z4$AV$A3$:PRINT#M,R$G
M$Q5$Z5$Q7$A3$Z4$HO$QA$Q2$DV$Z6$
QA$Q2$"?"Z6$QA$Q4$P$P$P$STRING$(
8,4)STRING$(6,16)O$O$QA$Q8$Z8$DV
$AV$A1$AV$Z8$DV$Q6$A3$A7$AF$AV$"
?"Z5$DV$A6$Q1$A7$Z5$DV$A7$
2130 PRINT#M,R$GN$Q5$Z6$AF$Q4$AF
$Z4$HG$QA$Q2$"?"Z8$Q9$A7$"?"Z6$H
G$EØ$QA$Q6$P$P$STRING$(10,66)O$O
$O$QA$Q9$ZB$Z1$A5$AE$AU$"?"DV$Z8
$HT$H7$EF$AV$"?"Z7$HS$HG$HØ$:PRI
NT#M,R$GK$Q5$HG$HU$Z5$DV$Q1$A7$D
V$Z5$QA$Q3$Z9$A7$Q5$A1$AF$Z8$HG$
QB$P$P$P$;
2140 PRINT#M,N$"@"N$"@"O$O$QA$Q8
$A3$AV$"?"HP$HQ$HL$HA$HL$HA$HL$H
Q$ZA$Z5$DV$CV$FV$GV$HF$GN$HF$HN$
HN$ZA$Z3$A3$:PRINT#M,R$GM$Q6$A1$
Z6$A3$HO$HU$Z6$"?"AF$A3$Q8$DV$ZA
$AF$Q1$A1$AF$DV$ZA$QB$P$P$"@ @"N
$"@"O$O$O$QA$Q8$AV$HT$H8$"@"Q1$E
Ø$"@"A4$"Q"FA$;
2160 PRINT#M,"T"FA$ZC$Z8$DV$A7$:
PRINT#M,R$GM$Q6$Z9$"?"EF$HH$Z8$D
V$"?"AV$AF$A3$A1$DV$ZA$Z2$DV$Z1$
HU$ZA$Z1$QB$Q3$P$P$P$O$O$QB$AF$H
Ø$S1$Q5$A9$B2$Q$CT$FE$Z8$HT$HS$H
U$Z1$HN$HJ$HR$HP$HT$Z4$H$ZA$Z6$
2170 PRINT#M,R$GN$Q6$AF$ZA$Z1$"?
"HR$Z5$HT$HU$HT$HR$HL$HA$ZA$Z7$D
V$"?"FV$"?"GV$EN$F9$G2$HG$HK$HS$
A6$A1$QB$Q1$P$P$"@ @ @@@ @"O$O$Q
B$Q3$HJ$FE$Q5$AG$Q1$"*T"FA$CV$Z5
$M$N$GØ$L$GG$GG$H8$I$GE$GF$GF$H6
$H$G$HN$HJ$HJ$HR$Z7$HR$HL$G3$A2$
A1$
2180 PRINT#M,R$GQ$Q5$A3$ZA$Z5$GN
$FA$"U"FB$"W"FB$"W"CV$CV$ZB$Z3$H
U$H8$"!"EK$Q2$EØ$EG$"y"A7$QB$Q3$
P$P$"@ @"O$O$QB$Q5$HO$FF$Q4$A1$A
2$E8$Q$CV$Z6$QA$Q5$N$"@@"GØ$M$"@
@@"M$EØ$GØ$HG$HS$Z2$DV$FV$CV$GN$
"R"AF$
2190 PRINT#M,R$GQ$Q4$A1$ZD$Z6$HT
$FA$HD$FA$B2$A8$Q5$EG$H4$AV$QB$P
$P$"@ @ @ "O$O$QB$A$A$HØ$AX$"+"A
M$"M+W"FF$CV$Z8$A3$QC$G1$HU$Z1$H
O$Z1$HS$HP$Z1$:PRINT#M,BY$H5$Q9$
A6$A3$A1$A3$A1$Q2$HO$ZD$Z5$FQ$Q$
Q$"D"AG$Q6$E8$FF$HG$QB$Q2$P$"@ @
 @ @ ";
2200 PRINT#M,O$O$QB$Q6$HG$"?GCG"
F7$EJ$GF$GJ$H9$HØ$H8$HK$HØ$HK$HO
$HI$HL$HQ$HQ$HU$HT$Z1$AV$AF$A7$A
3$A1$QB$Q3$A2$AX$HK$"Ø"GØ$"@"EØ$
Q1$EØ$:PRINT#M,BY$GX$Q8$EG$"Z"FF
$GN$"k"HN$Z1$DV$"?"HR$HL$H$Z5$HR
$;
2210 PRINT#M,HP$HP$HP$HT$Z5$HN$H
7$H7$HF$Z3$HR$HJ$H7$HE$HS$HT$ZA$
Z4$GN$FA$Q$"D"AG$Q6$E9$GV$HØ$QB$
Q4$P$P$"@ @ @ @"O$QB$Q5$A7$Z4$I$
J$HS$DØ$N$EØ$Q3$A3$A6$E1$GØ$"P"F
8$GK$HA$HT$Z2$DV$"?;9ppppppp8<"A
U$AF$A7$A3$"=<"
2220 PRINT#M,S1$BY$GL$Q5$EØ$M$L$
K$J$HS$DS$I$DS$FS$FS$I$HU$HQ$"z:
z"H$FU$">4d"H8$HO$HG$HØ$M$N$Q6$E
Ø$HØ$HS$Z7$FQ$Q$"D"AG$Q6$A4$EN$H
O$QB$Q5$P$" @ @"O$O$QB$Q5$AX$"w"
GØ$E3$Z1$G3$A1$A2$A4$A6$AD$AE$D$
A3$"%2y"FS$AV$A6$A5$HS$FA$"("A1$
FA$"W"Z5$HO$DS$;
2230 PRINT#M,DU$CU$E$D$D$STRING$
(3,14)ES$HS$HO$HG$DØ$"@":PRINT#M
,S9$BY$FG$Q3$Z6$"u"FA$"U"E8$"!"Q
6$E7$HS$"Ø"QB$Q9$P$"@ @@ @ @ "O$
QC$Q1$EØ$M$HH$DR$DV$AN$A9$HK$F9$
"*"GL$Z3$G$"?"Z1$"?"DV$FV$G$Z2$H
U$HS$HO$HG$HO$Z1$DV$AV$A7$A1$QB$
Q3$AE$AE$
```

• *RADIO SHACK™ COLOR COMPUTER*

ADVANCED MATH PROGRAMS
for
ENGINEERS • PHYSICISTS • STUDENTS

FUNCTION GRAPHING MODULE 16K EXT-$19.95

- * HIGH RESOLUTION GRAPHS
- * GRAPH ANY FUNCTION — 4 AT ONCE
- * PARAMETERS EASY TO CHANGE
- * AUTO-SCALING OPTIMIZES GRAPH SIZE
- * COMPUTE FUNCTION VALUES & ZEROS
- * INTERSECTION OF FUNCTIONS
- * COMPLETE MANUAL — PROGRAM ON TAPE

CALCULUS MATH MODULE 32K EXT-$37.95

- * INCLUDES THE GRAPHING MODULE ABOVE
- * LOAD UP 9 FUNCTIONS AT ONCE
- * FIND AND COMPUTE MAXIMA & MINIMA
- * NUMERIC INTEGRATION & DIFFERENTIATION
- * COMPOSITE AREAS
- * HANDLES PIECEWISE CONTINUOUS FUNCTIONS
- * HARD COPIES OF DATA AND/OR GRAPH
- * COMPLETE MANUAL — ON TAPE OR DISK

RAINBOW CERTIFICATION SEAL

CALCSOFT
P.O. BOX 401
ST. ANN, MO 63074

RAINBOW CERTIFICATION SEAL

SEND CHECK OR MONEY ORDER
Add $2.00 for shipping

```
2240 PRINT#M,BY$GE$Q7$AX$AX$QD$Q
7$"?"Z5$FR$Q$"U"B2$AG$A4$Q1$A$"J
"DS$FG$QC$Q3$P$"@ @ @ @"O$QC$Q2$
AU$Z2$H0$E0$Q2$E1$G$Z3$J$Z2$HP$H
O$K$H0$G0$E0$Q6$HU$Z1$HS$Z1$HU$A
V$:PRINT#M,S8$BY$EU$Q6$A7$Z8$CV$
FF$"S+"EG$A5$".p"E0$QC$Q7$P$"@ @
"O$;
2260 PRINT#M,QC$Q6$H0$HU$DV$AF$A
U$DS$HS$HO$H0$G0$E0$Q3$HG$HS$Z3$
DV$AR$AO$A8$Q9$H0$G0$HO$:PRINT#M
,S8$BY$EN$Q2$A1$AF$"?"Z6$HU$HT$H
U$FT$FT$FO$"4"HO$HK$HO$AO$A8$AG$
AH$AJ$"(1a"G7$DU$QC$Q3$P$A4$A8$A
8$AG$" @ @"E8$QE$Q6$E0$G0$D0$FG$
EO$"H"Q3$AU$AU$
2270 PRINT#M,S3$BY$"m"Q6$AX$AX$Q
A$Q4$A1$B$A7$A6$AE$AE$STRING$(3,
28)I$HS$HU$Z3$Q$"P"F1$"@"A5$A2$A
1$Q3$S1$AG$HO$Z1$I$I$GS$AX$AX$A4
$A6$A6$A3$QC$N$N$"HH$$("AI$A2$"$
DH"E8$
2280 PRINT#M,S4$BY$"f"Q9$A1$A3$A
E$AK$"(p"G0$E0$Q3$A$A1$B$A3$AF$"
?"DV$Z4$FA$"U"AG$"R>"G2$A1$Q2$FS
$Z1$DU$"xA"A1$Q1$A$A2$A1$A2$A1$A
3$STRING$(3,2)A3$G7$"?"AF$A6$QC$
Q2$"@H$$(H"E0$SA$S5$BY$A5$Q4$AX$
AX$
2290 PRINT#M,S1$BY$"I"Q6$B$QA$Q9
$M$H0$K$"pxxxxx"J$J$HO$HG$HH$HJ$
Z6$CV$"/"AN$"K"EN$"+"GN$EF$HN$"/
"CV$FV$CV$DV$FH$D0$D0$HG$FO$EU$A
F$A3$:PRINT#M,S1$BY$"J"Q6$N$QC$Q
2$A7$AV$"?"Z2$HU$Z2$G0$Q2$N$E0$M
$M$G0$Z2$DV$EV$G7$G1$H0$HG$"X8"A
X$A8$A8$I$A4$
2310 PRINT#M,S7$BY$AU$Q2$AF$Z2$H
S$Z3$Q1$G0$HO$HS$Q8$A7$"?"HU$HG$
Z2$HU$Z1$DV$A7$:PRINT#M,S7$BY$AU
$Q1$HG$Z3$Q2$H0$G0$QA$Q1$M$E0$A4
$DS$HO$H0$AF$Z2$HU$:PRINT#M,S7$B
Y$AT$Q2$G0$HG$HO$QB$Q2$HS$HO$H0$
EC$;:NEXTCN:GOSUB90
3000 CY$="BLUE":GOSUB35:Q$=AH$+"
D":S$=AG$+E4$+AH$+Q1$+S1$+EA$:R$
="U"+FA$+"U"+FA$+"U"+FA$:P$="@"+
AG$+E0$+"("+E0$+"$"+S$:T$=AL$+AQ
$:O$=EG$+A5$+F0$+A9$+B2$+E4$+AG$
+A4$+S1$+"H "+E0$:FORCN=1TONC:GO
SUB3:PRINT#M,"":T=170:GOSUB26:T=
164:GOSUB26
3050 T=136:GOSUB26:GOSUB27:PRINT
#M,STRING$(48,65)"@@@@"STRING$(1
9,65)"@@@@"STRING$(92,65)"@@@@"S
TRING$(16,65)"@@@@"STRING$(37,65
):GOSUB27:PRINT#M,STRING$(46,2)Q
5$STRING$(19,2)Q4$STRING$(94,2)Q
4$STRING$(16,2)Q4$STRING$(36,2)
3070 GOSUB27:PRINT#M,STRING$(9,2
)Q4$STRING$(32,2)Q5$STRING$(18,2
)Q5$STRING$(41,2)Q6$STRING$(49,2
)Q4$STRING$(15,2)Q4$STRING$(5,2)
Q3$STRING$(6,2)Q3$STRING$(19,2)
3080 GOSUB27:PRINT#M,STRING$(9,1
)Q4$STRING$(31,1)Q4$STRING$(19,1
)Q4$STRING$(43,1)Q5$STRING$(51,1
)Q4$STRING$(13,1)Q5$A$A$A$A1$Q4$
A$A$A1$Q4$STRING$(16,1):PRINT#M,
""
3100 GOSUB27:PRINT#M,STRING$(9,6
4)Q5$STRING$(13,64)Q4$STRING$(11
,64)Q6$STRING$(16,64)Q4$STRING$(
18,64)P$;:FORU=1TO11:PRINT#M,"BP
D@";:NEXTU:PRINT#M,O$STRING$(17,
64)Q6$STRING$(9,64)Q7$STRING$(8,
64)Q4$"@@@@@"Q4$STRING$(14,64)
3110 GOSUB27:PRINT#M,STRING$(10,
8)Q4$STRING$(10,8)Q5$STRING$(12,
8)Q6$STRING$(15,8)Q5$STRING$(11,
8)P$S$S$S$S$S$S$Q$S$S$S$O$STRING
$(14,8)Q7$STRING$(6,8)Q7$STRING$
(12,8)Q4$STRING$(4,8)Q5$STRING$(
11,8)
3120 PRINT#M,TAB(14)BY$"L"Q4$P$S
$S$Q$S$S$Q$S$S$Q$S$AI$O$:GOSUB27
```

THE OTHER GUY'S Software

KEEP - TRAK "DOUBLE-ENTRY" General Ledger Accounting System Reg. ~~$69.95~~ — ONLY $19.95

"Double-Entry" General Ledger Accounting System for home or business: 16k, 32k, 64k. User-friendly, menu driven. Program features: balance sheet, income & expense statement (current & 'YTD'), journal, ledger, 899 accounts & 2350 entries on 32k & 64k (710 accounts & entries on 16k) disk only. Version 1.2 with screen printouts. For upgrade return original disk & $5.00. 1.1 Rainbow Review 9/84

"OMEGA FILE" Reg. ~~$69.95~~ — ONLY $14.95

Filing data base. File any information with Omega File. Records can have up to 16 fields with 255 characters per field (4080 characters/record). Sort, match & print any field. User friendly menu driven. Manual included (32k/64k disk only).

"A M T" Reg. ~~$29.95~~ — ONLY $14.95 Rainbow Review 10/84

AMT starts where everyone else ends. AMT calculates almost any sales or purchase outcome. Total interest, total principle, total payment are all figured. AMT is not just an amortization scheduling program, but a cost forecasting and prediciton program. Useful to anyone who plans to sell or buy something with interest. (Disk Only).

BOB'S MAGIC GRAPHIC MACHINE

Turns 2 weeks of graphic programming into 2 hours with 'rubber band" type graphics. Generate BASIC code to use in your programs. Easy drawing and manipulation of circles, elipses, boxes, lines and ARCS. Single joystick operation with on line HELPS at all times. Allows text on the graphics screen and movement of objects on the screen. Can be used as a stand-alone graphics editor. Great for programmers and LOTS OF FUN for the novice. **Reg. ~~$39.95~~ — ONLY $14.95** for cassette and **$14.95** for disk. 64k with ECB required. (includes instruction manual). **GRAPHICS EDITOR**

PERSONAL INFORMATION FILE—$14.95 disk **HOME INVENTORY—$14.95 disk**
CASH-IN (billing)—$14.95 disk **MEMO WRITER—$14.95 disk**
GRADE EASY (teacher data base)—$14.95 32/64k disk

64 K UPGRADE	$42.00	VOLKS MODEM	$59.95
FLIP & FILE 50	$19.95	RITEMAN PLUS PRINTERS	$275.00
FUJI-MAXELL SSDD	$17.95	RITEMAN 15"	$549.00
DATA DEFENDER 70 w/lock	$21.95	GENERIC DISKS SSDD	$14.95

COMPARE FEATURES AND PRICE, then buy "THE OTHER GUY'S SOFTware!"

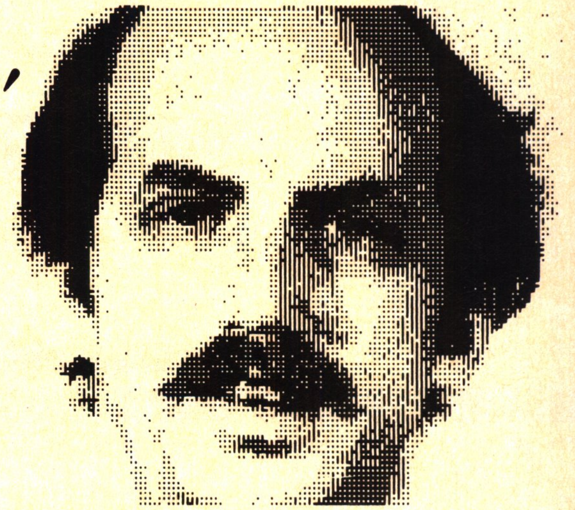
(add $2.50 for postage and handling)
Send check, money order or C.O.D., U.S. funds to:
THE OTHER GUY'S SOFTware • 875 S. Main • Logan, UT 84321
PHONE (801) 753-7620 or WRITE for a FREE CATALOG

```
:PRINT#M,STRING$(10,128)Q6$N$N$N
$Q5$STRING$(13,128)Q8$STRING$(11
,128)Q8$STRING$(17,128)P$S$S$S$S
$S$S$S$O$STRING$(22,128)QB$Q1$N$
E0$N$QA$Q1$N$QA$N$N$N$E0$
3140 PRINT#M,TAB(15)BY$"A"Q2$P$S
$S$Q$S$S$Q$S$S$O$:PRINT#M,TAB(15
)BY$"?"Q4$P$S$S$S$S$S$S$O$:PRINT
#M,TAB(15)BY$"="Q4$P$S$Q$S$S$Q$S
$S$O$:PRINT#M,TAB(16)BY$"4"Q1$P$
S$S$Q$Q$S$S$O$:PRINT#M,TAB(16)BY
$"3"Q2$P$S$Q$S$S$S$O$:PRINT#M,TA
B(16)BY$"4"Q3$;
3200 PRINT#M,P$S$S$Q$S$S$O$:PRIN
T#M,TAB(16)BY$"/"Q4$P$S$Q$S$S$O$
:PRINT#M,TAB(17)BY$"*"Q1$P$S$S$S
$O$:PRINT#M,TAB(17)BY$"*"Q2$P$S$
Q$S$O$Q3$S6$BY$","Q6$"@ "AO$QB$Q
6$A1$Q1$A5$AI$S$:PRINT#M,TAB(17)
BY$"$"Q5$P$S$Q$O$S5$BY$"6"Q6$N$"
x"AG$QC$Q1$Q$;
3240 PRINT#M,S$S$:PRINT#M,TAB(18
)BY$AU$Q1$P$S$O$SA$S2$BY$AO$Q1$S
$S$S$S$:PRINT#M,BY$AI$Q7$S$"U"Q5
$SA$S5$BY$AO$Q1$P$O$SA$S3$BY$AO$
Q3$S$S1$E0$Q2$"@"A8$S$Q$Q$:PRINT
#M,S1$BY$A6$Q1$S$SA$S6$BY$AO$Q5$
P$Q$"B $@"A8$Q1$SA$S3$BY$AO$Q3$S
$Q6$S$Q$Q$
3270 PRINT#M,S1$BY$A6$Q1$Q$Q$Q2$
SA$S8$BY$"o"Q1$A2$E0$AK$"B"A8$"@
"A$A9$"A"A$A3$A1$A3$A6$A5$A6$A5$
AQ$T$T$T$T$T$AL$A6$A5$A6$A5$A6$A
3$A2$A3$A2$A3$A2$STRING$(21,1)Q9
$S$S$QB$Q3$Q$Q$
3280 PRINT#M,S1$BY$AO$Q1$Q$QA$S$
S$S5$BY$A6$Q5$"<B"S5$BY$"j"Q1$A$
A$A$A3$A2$A3$A6$A5$A6$A5$AE$T$T$
T$T$T$;:T=11:GOSUB15:PRINT#M,"Uj
5*"T$AL$A2$S$Q$:PRINT#M,S2$BY$AI
$Q9$S$Q$Q2$S8$BY$ES$Q1$A4$A6$A5$
AE$T$T$AL$"*5*UjU"FA$GL$FA$;:T=1
6:GOSUB15
3300 PRINT#M,"U"FA$AL$S$"*U"FA$"
Uj5*"T$T$T$A5$A2$S$"U"FA$STRING$
(10,1):PRINT#M,BY$HA$Q7$A8$A2$AG
$"!"A8$"A"A2$AG$A1$"!"A8$A2$Q3$S
$STRING$(10,1)A2$A5$AE$T$T$AL$AO
$S1$Q3$A1$Q2$"*"R$AL$"*"AL$"*"Q3
$S1$AG$"*"T$A6$A2$A1$A2$A1$A2$;
3310 PRINT#M,A1$F2$"U"FA$"U"FA$;
:T=22:GOSUB15:PRINT#M,"U"S$"*U"F
A$"U"FA$R$:PRINT#M,BY$HA$Q7$"U"A
H$S1$E4$S$"U"FA$R$R$R$R$"U"F0$Q2
$A1$Q3$"U*"A5$A2$R$"U"FA$"P"F0$A
1$"*"Q4$"@"F8$;:T=26:GOSUB15:PRI
NT#M,R$
3320 PRINT#M,BY$HA$Q7$"U"FA$"E"S
$"*U"FA$R$R$R$R$A5$Q3$"U"FA$AL$"
*U"FA$"U"FA$R$"U*"AL$"*U"A2$A5$"
*P"Q3$;:GOSUB15:PRINT#M,R$
3330 PRINT#M,BY$HA$Q7$R$R$R$R$R$
R$"U*"AL$A2$"U"FA$R$R$R$"U"FA$AL
$A2$AL$FA$;:GOSUB15:PRINT#M,R$:T
=37:FORX=1TO13:PRINT#M,BY$HA$Q7$
;:GOSUB15:PRINT#M,R$:NEXTX
3340 T=19:GOSUB10:PRINT#M,TAB(53
)AR$"4"AR$"E"BY$A3$Q4$"It's time
 to be":PRINT#M,"":PRINT#M,TAB(5
5)BY$A3$Q4$AR$"E""Wishing you":P
RINT#M,"":PRINT#M,TAB(55)"The ME
RRIEST":T=4:GOSUB10:PRINT#M,TAB(
59)BY$A3$Q4$AR$"E"AR$"4""and":PR
INT#M,""
3350 PRINT#M,TAB(55)"The HAPPIES
T":T=3:GOSUB10:PRINT#M,TAB(59)"E
VER.":T=4:GOSUB10:PRINT#M,TAB(NX
)NC$AR$"5"EC$;:NEXTCN:GOSUB90
4000 CY$="GREEN":GOSUB35:P$=S1$+
D0$+GG$+EO$+"t"+FL$+"TfZ9"+GQ$+G
D$:O$=H7$+FQ$+"vI6"+FD$+"T$pX"+D
0$+S1$:Q$=E0$+F0$+H8$+HM$:R$=Z1$
+GK$+GG$+E0$:FORCN=1TONC:GOSUB3:
T=6:GOSUB10:PRINT#M,SB$BY$A6$Q1$
A3$AF$E$AF$A7$
4070 PRINT#M,TAB(18)BY$AI$QA$Q2$
HG$Z5$HU$:PRINT#M,SB$BY$A5$Q1$Z5
$:PRINT#M,TAB(15)BY$"F"Q1$P$ES$D
R$AV$"?"HN$DV$AV$AF$EF$HJ$"o"AV$
DV$AV$"?"AV$AF$A5$Z5$D$"?"AV$DV$
DR$H7$D$AT$AN$AV$"7oo"Z1$E5$E5$"
?;"CV$Z1$AR$O$
4110 PRINT#M,TAB(14)BY$"P"Q1$P$;
:T=56:GOSUB14:PRINT#M,TAB(14)BY$
"L"Q4$P$;:T=49:GOSUB14:PRINT#M,T
AB(14)BY$"K"Q6$P$;:T=46:GOSUB14:
PRINT#M,TAB(15)BY$"C"Q2$P$;:T=42
:GOSUB14:PRINT#M,TAB(15)BY$"B"Q1
$P$;:GOSUB14
4160 PRINT#M,TAB(15)BY$"?"Q3$P$;
:T=37:GOSUB14:PRINT#M,TAB(15)BY$
"<"Q4$P$;:T=33:GOSUB14:PRINT#M,T
AB(16)BY$"4"Q2$P$;:T=27:GOSUB14:
PRINT#M,TAB(16)BY$"3"Q1$P$;:T=27
:GOSUB14:PRINT#M,TAB(16)BY$"/"Q4
$P$;:T=20:GOSUB14
4210 PRINT#M,TAB(16)BY$"0"Q6$P$;
:T=19:GOSUB20:PRINT#M,O$SA$S1$BY
$AF$Q5$">?"B$B$A3$A$A$:PRINT#M,T
AB(17)BY$"*"Q1$P$;:T=16:GOSUB20:
PRINT#M,O$Q2$SA$S1$BY$AI$Q1$A$A1
$B$A7$AF$EV$FV$Z5$R$:PRINT#M,TAB
(17)BY$"*"Q4$P$;:T=10:GOSUB20
4230 PRINT#M,O$Q5$SA$BY$AX$Q1$Q$
ZA$Z5$CT$CR$G1$E1$A1$D$A$:PRINT#
M,BY$AI$Q7$E$B$A3$A$A1$Q4$SA$S4$
```

TALKHEAD

FOR THE 'REAL TALKER'

"Way beyond anything you have ever seen for the CoCo"



That's a strong statement, we know. But wait until you see 'TALKHEAD'! It's a dazzling creation—easily the most impressive display of CoCo graphics you can buy!

If you have a 'REAL TALKER' voice synthesizer, DO NOT deprive yourself of this absolutely incredible Talking Head simulation program! TALKHEAD uses the 'Real Talker' and extremely high speed/high resolution machine language to create an audio-visual simulation that clearly goes way, way beyond anything that you have ever seen on ANY home computer!

TALKHEAD's fast, smooth-talking animation is so stunningly life-like that it resembles a movie more than a cartoon! This page shows some still shots of the actual moving image as it will appear on your TV screen.

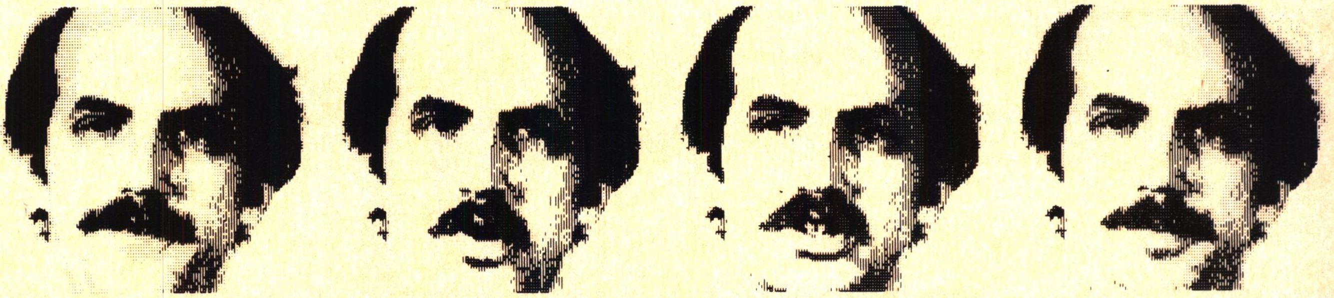
And, TALKHEAD is a real snap to use in Basic, thanks to a new command that we give you: SAY. Type SAY "ANYTHING YOU WANT" and Talkhead instantly appears and speaks ANY text—it has an unlimited vocabulary!

The most impressive CoCo program you can buy . . .

'TALKHEAD' is available on cassette or disk (please specify) for ***only $29.95.*** The cassette version can be transferred to disk in case you ever upgrade. TALKHEAD requires 64K of memory and a Colorware 'REAL TALKER' voice pak.

ONLY $29.95 FROM COLORWARE

PROGRAM BY TIM JENISON SPEECH PROGRAMMING BY H. PUNYON



'TALKHEAD's eyes, mouth and jaw move, realistically animating his speech. The effect is amazing!

MORE SOFTWARE FOR THE 'REAL TALKER' VOICE PAK

STELLAR SEARCH ADVENTURE

If you ever had an urge to command the USS Enterprise, this talking version of 'STELLAR SEARCH' from Owl-Ware is for you! It uniquely combines the best aspects of 'adventure' and graphic 'action' type games and puts the 'Real Talker' voice pak to good use. You'll find graphics galore in this exciting package containing more than 86K of action adventure. Requires 32K and a 'Real Talker' voice pak. ***Cassette....$24.95. Disk....$26.95***

TALKING EDUCATIONAL SOFTWARE

SOFTWARE FOR CHILDREN FROM COMPUTER ISLAND

Math Drill	**$ 9.95**
Foreign Languages	**$ 9.95**
Spelling Tester	**$ 9.95**
All 3 for Only	**$24.95**

Requires 16K and a Colorware 'Real Talker' voice pak.

ADVENTURE STARTER

The popular 'ADVENTURE STARTER' from Owl's Nest Software is now available in a speaking version for the 'Real Talker' voice tynthesizer. Adventure Starter is a painless and enjoyable way to learn about computer adventure games. Included are two adventures. The first is "MYHOUSE", an easy game with plenty of help and hints. A second adventure, 'PIRATES', is more challenging. Both are great fun for the adventure minded. This is the only way to get into CoCo adventuring! Requires 16K Extended Basic and a 'REAL TALKER' voice pak. ***Cassette, only $17.95.***

COLORWARE

COLORWARE INC.
78-03 Jamaica Ave.
Woodhaven, NY 11421
(212) 647-2864

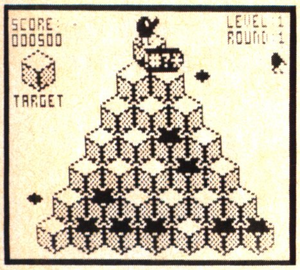
VISA

MasterCard

★★★ ORDERING INFORMATION ★★★

ADD $2.00 PER ORDER FOR SHIPPING & HANDLING.
C.O.D.'S: ADD $3.00 EXTRA.
SHIPPING & HANDLING FOR CANADA IS $4.00
WE ACCEPT VISA, MASTER CARD, M.O.'S, CHECKS.
N.Y. RESIDENTS MUST ADD SALES TAX.
ALL SOFTWARE ON THIS PAGE REQUIRES A COLORWARE 'REAL TALKER' VOICE PAK.

THE TOP 4 COCO GAMES...

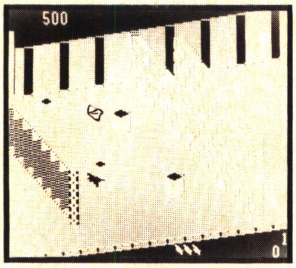


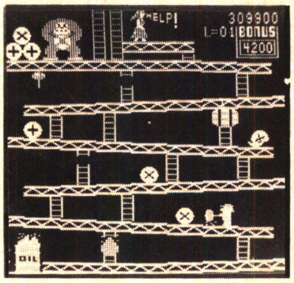
CUBIX

By Spectral Associates. Very much like the arcade smash! Jump little Cubix around the 3D maze trying to change the color of all the squares. With Death Globes, Discs, Snakes, etc. 32K Tape: $24.95

ZAKSUND

From Elite Software comes this fantastic arcade style space action game with 3 different stages of moving 3-D graphics. You've never seen anything like this on your CoCo! Great sound too! 32K Tape: $24.95



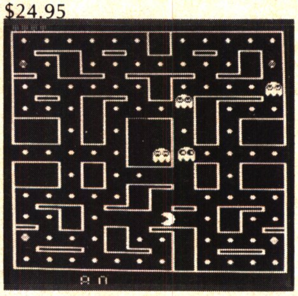


THE KING

Previously called 'Donkey King', you simply cannot buy a more impressive game for your CoCo. With 4 different screens and loads of fun! From Tom Mix Software. 32K Tape: $25.95

GHOST GOBBLER

From Spectral Assoc. This "PAC" theme game has been improved several times. It is definitely the best of its type. Brilliant color, action and sound, just like an arcade. 16K Tape: $24.95



COLORCADE

SUPER JOYSTICK MODULE

WITH RAPID FIRE!

ONLY $19.95

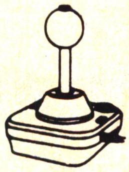
JOYSTICK INTERFACE/RAPID FIRE/6 FT. EXTENDER ALL IN ONE! The Colorcade allows connection of any Atari type joystick to your CoCo (including the Wico Red Ball). These switch type sticks are extremely rugged and have a faster and more positive response. They will improve the play of almost any action game.

An adjustable speed rapid fire circuit is built in. Press your fire button and get a great burst of fire instead of just a single shot! You get a real advantage in shooting games that do not have repeat fire.

ATARI JOYSTICK

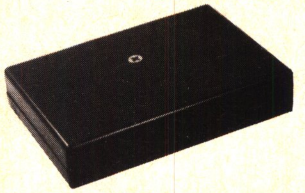
ONLY $8.50

THE BEST YOU CAN BUY
WICO #15-9730
~~$34.95~~
$29.95



WICO FAMOUS "RED BALL"

ROM/ PROJECT/ PRODUCT CASE

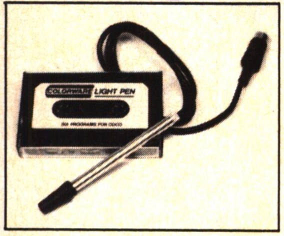


Give a professional look to your project or product! High quality 3 piece injection molded plastic with spring loaded door. Designed especially for the CoCo ROM slot.

2 - 4 pcs.	$5.50 Ea.
5 - 9 pcs.	$3.50 Ea.
10 - 99 pcs.	$2.75 Ea.
100 & UP	Call Us.

P.C. board for 27XX EPROMS. . . $4.00 Ea.

COLORWARE LIGHT PEN

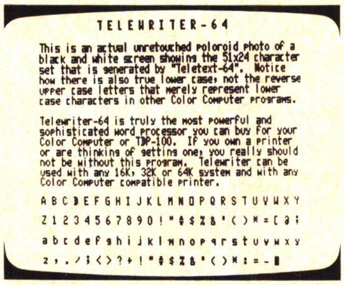


ONLY $19.95

WITH SIX FREE PROGRAMS ON CASSETTE!

The Colorware Light Pen plugs directly into your joystick port and comes with six fun & useful programs on cassette. Easy instructions show how to use it with Basic and it's compatible with light pen software such as Computer Island's "Fun Pack." Order yours today. Only $19.95 complete.

TELEWRITER-64



```
TELEWRITER-64

This is an actual unretouched poloroid photo of a
black and white screen showing the 51x24 character
set that is generated by "Teletext-64".  Notice
how there is also true lower case, not the reverse
upper case letters that merely represent lower
case characters in other Color Computer programs.

Telewriter-64 is truly the most powerful and
sophisticated word processor you can buy for your
Color Computer or TDP-100.  If you own a printer
or are thinking of getting one, you really should
not be without this program.  Telewriter can be
used with any 16K, 32K or 64K system and with any
Color Computer compatible printer.

A B C D E F G H I J K L M N O P Q R S T U V W X Y
Z 1 2 3 4 5 6 7 8 9 0 ! " # $ % & ' ( ) * = [ @ ;
a b c d e f g h i j k l m n o p q r s t u v w x y
z , . / ; < > ? + ! " # $ % & ' ( ) * : = - █
```

DISK $59.95
CASSETTE. . . $49.95

Colorware researched the word processors available for the Color Computer. This is the best. Telewriter-64 is a truly sophisticated system that is marvelously easy to use. It works with any 16K, 32K or 64K system and any CoCo compatible printer.

TOP-RATED COCO WORD PROCESSOR

COLORWARE

VISA MasterCard

TOLL FREE ORDERING
800-221-0916

ORDERS ONLY. N.Y. & INFO CALL (212) 647-2864

'REAL TALKER'

HARDWARE Voice Synthesizer

NEWfrom COLORWARE.. only... $59.95

COLORWARE
'REAL TALKER'
'REAL TALKER' TEXT TO SPEECH
COLORWARE
VOICE SYNTHESIZER
MANUAL
PHONETIC SPEECH DICTIONARY for the SC-01 SPEECH SYNTHESIZER

THINKING OF BUYING A COCO VOICE SYNTHESIZER?

READ THIS....

Making your computer talk couldn't be any easier! 'Real Talker' is a full featured, ready to use, HARDWARE voice synthesizer system in a cartridge pak. It uses the Votrax SC-01 phoneme synthesizer chip to produce a clear, crisp voice.

FREE TEXT-TO-SPEECH

Included free with 'Real Talker' is Colorware's remarkable Text-to-Speech program. This is a truly powerful machine language utility. What it does is automatically convert plain English to speech. And it has an unlimited vocabulary! For example, use it in the direct mode: Type in a sentence or a paragraph, even mix in numbers, dollar signs, etc., then press enter. The text is spoken. At the same time a phoneme string is generated which can be saved to cassette or disk, modified or used in a Basic program.

We originally planned to sell this major piece of programming for about $40.00 but decided it was so useful that no 'Real Talker' user should be without it. Besides, it really shows off the capability of 'Real Talker'.

Also included with 'Real Talker' is our unique Phoneme Editor program. It allows you to explore and create artificial speech at the phoneme level. Phenomes are the fundimental sounds or building blocks of word pronunciation. There are 64 different phenomes, as well as 4 inflection levels at your disposal. Creating and modifying speech at the phenome level is both fascinating and educational. The Phenome Editor may also be used to customize the pronunciation of speech produced by the Text-to-Speech program.

You don't have to use any of our utility programs though. If you write your own Basic Programs, you will find the pocket sized Votrax Dictionary (included free) is all you need to make your own Basic programs talk. This dictionary gives you quick access to the phenome sequences used to create approximately 1400 of the most used words in the English language.

How about compatibility? 'Real Talker' is compatible with any 16K, 32K, 64K, Extended or non-extended Color Computer. It works with any cassette or disk based system, with or without the Radio Shack Multi-slot expander. No other synthesizer under $100 can make this claim. Most other CoCo voice synthesizers require an expensive Multi-slot expander in order to work with the disk system. 'Real Talker' requires only an inexpensive Y-adapter. This is an important consideration if you plan on adding a disk or have one already.

'Real Talker' comes completely assembled, tested and ready to use. It is powered by the CoCo and talks through your T.V. speaker so there is nothing else to add. Price includes Text-to-Speech and other programs on cassette (may be transferred to disk), User Manual and Votrax Dictionary. ONLY $59.95

'Y-BRANCHING CABLE' For disk systems. This 40-pin, 3 connector cable allows 'Real Talker' to be used with any disk system $29.95

YOU DECIDE....

Order yours today on our Toll-Free Order Line. If you are not delighted with your 'Real Talker' system, simply return it within 30 days for a prompt, courteous refund.

COLORWARE

COLORWARE INC.
78-03F Jamaica Ave.
Woodhaven, NY 11421
(212) 647-2864

VISA
MasterCard

★ ★ ★ ORDERING INFORMATION ★ ★ ★

ADD $2.00 PER ORDER FOR SHIPPING & HANDLING.
C.O.D.'S: ADD $3.00 EXTRA.
SHIPPING & HANDLING FOR CANADA IS $4.00
WE ACCEPT VISA, MASTER CARD, M.O.'S, CHECKS.
N.Y. RESIDENTS MUST ADD SALES TAX.

```
BY$"$"Q6$P$GR$GV$FR$FW$HT$Z1$GF$
O$SA$S1$BY$AU$Q3$Q$ZB$HU$HT$HM$C
V$ZA$:PRINT#M,BY$AI$Q7$Z7$R$Q1$S
A$S5$BY$AU$Q1$P$GV$FR$HT$O$Q3$;
4260 PRINT#M,SA$S1$BY$AU$Q5$Q$Z7
$FK$"T"F0$"P"GT$ZA$:PRINT#M,BY$A
I$Q7$Z6$R$Q2$SA$S5$BY$DU$Q4$P$GR
$HT$FR$FU$"f"HM$H4$GC$E8$QE$QA$A
$A1$B$E$B$A$A1$Q6$Q$Z4$R$Q$Z6$HU
$HG$
4270 PRINT#M,BY$AU$Q7$Z4$R$Q4$A$
A1$B$E$B$A$A1$SA$S4$BY$"x"Q1$E0$
G0$GG$GQ$HC$HE$Z5$HE$HE$GC$E8$"@
@"QE$Q7$Q$ZA$Z2$R$Q4$Q$R$Q4$Q$Z3
$R$
4280 PRINT#M,BY$"$"Q7$Z2$R$Q2$Q$
ZA$Z2$R$Q2$SA$S3$BY$"w"Q4$E0$"@"
H8$HC$HU$Z2$GT$GP$"X"EG$QE$QA$Q2
$Q$Z8$R$QA$E3$B$A3$E$B$A3$A1$Q$R
$:PRINT#M,BY$"$"Q7$R$Q1$C$Q3$Q$Z
8$R$Q4$SA$S4$BY$"1"Q1$G8$"1"HU$Z
1$G8$E4$E0$QE$QA$Q5$Q$Z4$R$Q8$Q$
Z8$R$
4300 PRINT#M,BY$AU$Q7$AV$F$G$Z2$
G$F$AV$EU$GX$HK$Z5$R$SA$S5$BY$A6
$Q2$"@"H0$HG$E0$Q1$SA$BY$"("Q9$Q
$R$QA$Q2$Q$Z4$R$:PRINT#M,BY$AU$Q
7$HS$Z9$R$Q$R$Q2$SB$S8$BY$AQ$Q1$
E0$QA$Q7$Q$R$:PRINT#M,BY$AP$Q7$Q
$Z4$R$Q5$"@"E0$:PRINT#M,BY$AG$Q9
$Q$R$
4310 T=45:GOSUB10:PRINT#M,TAB(53
)AR$"E"AR$"5"AE$"NEW YEAR"AR$"5"
EC$;:NEXTCN:GOSUB90
6000 CY$="BLACK":GOSUB35:O$=SA$+
S6$+BY$:P$=S2$+BY$+"B":Q$=AF$+HG
$:R$=SA$+S5$+BY$:S$=HG$+AF$:T$=F
A$+"U":FORCN=1TONC:GOSUB3:T=4:GO
SUB10:PRINT#M,S9$BY$AU$Q1$"?"DS$
HS$Z1$"8"QA$Q8$A7$"x"HO$HT$HU$"p
"Q1$SA$S4$BY$AT$Q4$" x"DV$DS$;
6005 PRINT#M,"?"A1$QA$Q6$DU$HP$H
O$"?"
6060 PRINT#M,S2$BY$"H"Q4$A7$E$AV
$A7$QC$Q2$A3$HU$Q1$A1$">"G0$QA$Q
8$Q$Q1$Q$Q3$SA$S4$BY$"-"Q6$H0$AV
$Q1$HO$A7$QA$Q6$Z1$Q1$G0$"?"QA$Q
1$C$A7$A3$:PRINT#M,S2$BY$"H"Q4$Z
1$N$Z1$E0$QC$Q1$AV$H0$Q2$Z1$QA$Q
8$"?"G0$Q1$A1$DU$E0$Q4$R$")"Q1$H
0$AV$Q1$;
6080 PRINT#M,HS$A3$QA$Q5$Z1$Q2$Z
1$Q4$"x"DU$"?"AU$A1$Q2$E0$G0$HS$
G3$S$:PRINT#M,P$Q4$Z1$Q2$Z1$QA$Q
6$A3$C$A3$QA$Q1$AV$H0$Q1$AV$H0$Q
A$Q8$"?"G0$Q1$AV$H0$O$","Q2$HO$A
7$Q1$G0$"?"QA$Q3$DV$E0$Q2$Z1$Q6$
S$HG$AU$A1$Q3$G0$"<"A3$H0$AU$A1$
6090 PRINT#M,P$Q3$DV$E0$Q2$HU$A1
$QA$Q4$Z1$H0$H3$HS$G0$QA$DV$E0$Q
2$Z1$QA$Q7$"?"G0$Q1$Q$Q2$O$"."Q3
$HO$A7$Q2$HO$A7$QA$A3$HS$Q3$Z1$Q
7$E0$DS$A3$S$Q4$S$Q1$H0$AU$A1$
6100 PRINT#M,P$Q4$Z1$Q3$Z1$QA$Q1
$A7$"8"H0$Q1$"?"G0$QA$A1$HU$Q3$A
V$H0$QA$Q5$A7$HO$Q2$Z1$Q4$O$"0"Q
4$S$Q2$E0$DS$A3$Q7$A7$HO$Q5$Z1$Q
8$H0$AU$E1$"p"AE$A1$Q2$E0$DU$A1$
Q1$H0$AU$A1$
6110 PRINT#M,P$Q5$Z1$Q2$HU$A1$Q9
$AV$H0$Q1$A7$"x"E0$QA$Q1$Z1$Q4$Z
1$QA$Q4$A3$"<"G0$Q2$"?"G0$Q4$O$"
2"Q5$Z1$Q4$G0$"<"A3$Q4$A7$HS$Q5$
Z1$QA$Q1$H0$AV$Q1$G0$"8"A7$Q2$H0
$AV$Q2$H0$AX$A3$
6120 PRINT#M,P$Q5$Z1$Q3$Z1$Q7$A3
$HS$Q2$A7$HO$QA$Q2$DV$E0$Q4$Z1$Q
A$Q2$A1$">"G0$Q4$Z1$Q5$O$"5"Q5$Z
1$Q3$A4$"*T"F9$"t"AE$A1$Q$Q6$E0$
DV$Q6$A3$A4$A8$AG$S1$G1$A4$A2$"U
"FA$"y"A6$Q1$A7$HO$Q3$E0$"x"A6$A
1$
6130 PRINT#M,P$Q5$Z1$Q4$S$Q4$Q$Q
2$Q$QA$Q2$"?"G0$Q6$Z1$Q9$A7$"8"G
0$Q4$Q$Q6$O$"5"Q5$Z1$A1$A2$"&"EO
```

INCREDIBLE!!

Turn your CoCo into
a powerful processor
with CCSM*

the most productive operating system and programming language available for any micro -- regardless of price!!

- Write professional software
- Virtual Memory, a la Mainframe
- Your programs can be as large as your disk

* CCSM - Comp Consultants Standard Mumps

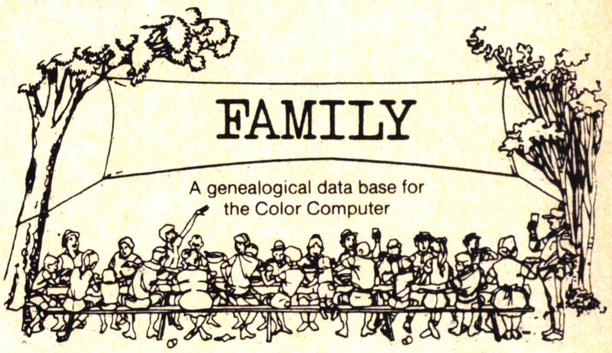
Call or Write:

Eclectic
Systems
Corporation

16260 Midway Road • Dallas, Texas 75234 • (214) 733-4100

```
$"P"FG$D0$F0$"/"HG$Q7$A1$"*"Z1$A
4$AE$AQ$"#I"E2$AL$"J%J"AL$"*W"FT
$"f"E8$AG$S1$G0$Q3$A2$AL$"+"AX$"
P"H0$
6140 PRINT#M,P$Q5$S$Q4$E0$DV$Q1$
A7$"x"E0$Q2$A2$Z1$QA$Q3$Z1$Q7$HO
$A7$Q5$A1$AE$"r"E0$Q5$Q$Q7$O$"2"
Q2$A1$AE$"0@"E0$Q7$HO$Q8$S1$F8$H
G$Q4$N$"@"G0$D0$FG$"W"FM$H0$E0$Q
8$FA$HT$A3$
6150 PRINT#M,P$Q6$A1$HU$Q4$HS$A3
$HO$FE$"K%"A9$Q1$A2$G0$"0"A8$A7$
Q8$DV$E0$Q8$S$Q1$A1$AE$"u"T$E8$A
2$Q5$Z1$Q8$O$"4"Q1$AV$H0$QC$Q2$"
P"E0$QA$Q1$E8$"Q"FA$DT$A7$:PRINT
#M,P$Q6$Z1$EL$"*"A1$Q4$G0$"0"EE$
"q"CV$T$B2$A9$A2$A9$E2$"A"B2$AH$
A9$A6$A1$DV$;
6170 PRINT#M,ED$QA$E0$"p"GV$FA$"
V"FB$"U"FB$"U"AI$"!"AH$A1$Q1$Z1$
Q8$R$":"Q6$Q$QD$Q7$AH$T$Z1$:PRIN
T#M,P$Q6$AF$HT$FA$AH$A4$Q6$H0$"<
"HJ$CV$T$FB$"V"FC$"T"F8$"P"FG$D0
$F7$HQ$"U*"QA$Q2$H0$AX$Q3$N$E0$G
0$D0$"0"HS$A6$A1$Q6$R$";"Q6$H3$A
X$QA$Q5$"?@@";
6180 PRINT#M,N$"@   "AG$AG$A8$A4$
A4$A2$A$QA$Q2$A1$A2$A2$"V*"FK$G2
$A2$A1$:PRINT#M,P$Q5$A3$HU$"U"FA
$AH$"D"Q9$HS$G7$E0$QC$Q7$E0$"x"A
7$Q4$R$">"Q6$S$QA$Q5$Z1$QA$Q5$N$
STRING$(9,64)G0$E0$"@0"AX$A3$Q3$
A1$G0$"p"AF$
6190 PRINT#M,P$Q4$A1$HU$T$FA$AH$
"D"QA$H0$QD$E0$H0$AV$Q2$R$">"Q3$
A$A$H0$AX$A3$QA$Q3$HU$A3$QC$H1$A
U$A3$"x"AF$HS$A1$Z1$:PRINT#M,BY$
"N"Q9$A6$A3$A1$A3$A1$Q2$HO$"W"T$
FA$AH$"D "A4$QE$Q1$EF$HG$Q1$R$"=
"Q2$HO$"wFCB"F1$EH$GD$"C!"S7$Q1$
"P P";
6210 PRINT#M,F8$HK$AQ$A9$A5$A2$A
1$QB$Q3$A2$AX$HK$"0"G0$"@"E0$Q1$
E0$:PRINT#M,BY$"N"Q8$EG$"J"F7$EK
$"J&"EI$"J$"HI$HG$CS$T$A9$"#"A8$
QB$Q3$A$A$A$QB$Q2$EV$H0$Q1$R$"/"
Q2$A7$HO$T$FA$"T"F8$","F8$GS$D0$
N$Q4$A3$A6$A1$Q6$N$"p&)(PPPPPPP(
$"AI$;
6220 PRINT#M,A9$A4$A2$A1$:PRINT#
M,S1$BY$"H"Q5$E0$"@@   "AG$AG$A8$
A8$A4$A4$E4$"D$"AK$STRING$(3,4)S
TRING$(9,2)A4$A4$A8$A8$AG$" @@"N
$Q6$E0$D0$AX$A3$QA$Q8$E7$HG$Q1$S
A$S4$BY$"8"Q6$AX$"c"E1$E3$Z1$E3$
A1$A2$A4$A6$A5$A2$A1$Q2$" 0x"FS$
AV$A6$A5$;
6230 PRINT#M,HS$FA$"("Q6$AH$AV$E
```

PETROCCI FREELANCE ASSOCIATES
602-296-1041


FAMILY

A genealogical data base for the Color Computer

Maintains data on 255 people in first eight generations of your family tree. Prints 3 charts; 5 generation pedigree - graphic display of lineage; Family group charts; ancestors by reference number. Easy to use.
32K EXT 14.95

WEATHER PRO

Over 4 years of research and testing are behind this program. Provides accurate area-specific forecast for current day, next day, and following day. Also gives deviance from the norm. Attractive printout for future reference. Well documented.
32KT - 24.95 32KD - 29.95

Voice synthesized version compatible with colorware's Real Talker. 32KT - 29.95 32KD - 34.95

AVAILABLE NOW FOR APPLE II+, II E, II C, TRS 80 MODEL I, III, AND IV AND COMMODORE 64

DATA FLEX

Dataflex makes personal, professional or school record keeping easy & convenient.
EDUCATORS TAKE NOTE! Dataflex is perfect system for teaching data base use to students. Organizes, Searches, Appends, Edits, Deletes and Prints Data. Sorts data by any of six fields.
32K EXT 24.95

All Programs 16K Tape
Unless Otherwise Specified
All Programs Available on Disk - Add $5.00
Special Sale Prices - Retail Only

Include $1.50 for handling for each program.
Arizona residents add 7% sales tax.
Quantity Discounts to Dealers

PETROCCI FREELANCE ASSOCIATES
651 N. Houghton Rd
Tucson, AZ 85748
602-296-1041

```
8$"DBR"AH$AH$STRING$(6,9)EA$EK$"
d"F8$EG$D0$:PRINT#M,S9$BY$AO$Q3$
Z1$QA$Q6$A3$GC$"0"Q2$SA$S2$BY$"7
"Q5$A8$A8$AV$">>>>"AX$A8$A8$Q5$E
0$M$HH$HQ$DS$C$HS$F8$AK$E0$QA$Q3
$A1$A2$A4$A8$"p"EO$G7$D0$AO$A6$A
1$
6240 PRINT#M,S9$BY$AO$Q2$"?"G0$Q
A$Q3$A1$A2$"1"EG$Q4$SA$S2$BY$"8"
Q1$A6$C$B$A3$Z1$QA$Q3$AV$H0$AV$D
0$E0$Q2$E1$DU$S1$AG$AG$AF$A8$A8$
A7$A6$A9$A8$AG$AG$" @"E0$Q6$HU$A
3$AX$A3$H2$AV$
6250 PRINT#M,S8$BY$AU$Q5$A1$AE$H
I$"U"FA$A5$A2$A5$A2$A1$Q5$A1$AE$
"p"E0$Q7$SA$BY$"D"Q1$"?"STRING$(
4,124)"8"Q9$N$N$QA$Q4$HO$G7$"9"A
9$AI$"b"E4$AO$" @"E0$Q3$HG$AE$A1
$G0$FB$"m"AQ$AP$A8$Q9$H0$G0$HO$
6260 PRINT#M,S8$BY$EI$Q2$A1$AE$"
0"H0$F0$G0$"@"G0$"@"G0$"@"G0$"@"
F0$S3$AG$HG$AO$A8$AG$AH$AM$"(0a"
G3$DU$QA$Q8$"?"STRING$(4,124)"8"
QC$AX$AE$AE$C$A7$Z1$QD$Q9$E0$"@
"EG$E8$"H":PRINT#M,S6$BY$"="Q4$A
1$A2$A3$A5$STRING$(4,6)AQ$AX$HS$
AK$AK$Q8$A1$;
6280 PRINT#M,Q1$A5$A2$A1$Q3$S1$A
G$HO$"W"FI$GK$EK$"4"GK$AK$AK$AX$
AE$A6$A3$Q7$AX$AE$AE$C$A7$Z1$:PR
INT#M,S5$BY$"9"Q3$A1$A2$A9$AM$"(
P"F0$"@"E0$Q2$A$A1$A2$A2$A4$A8$"
0@"E0$Q5$AG$"R<"G2$A1$Q2$FS$Z1$D
V$"x@"Q7$A$STRING$(3,2)A3$G7$"?"
AF$A6$
6290 PRINT#M,S5$BY$"1"Q2$E0$"@@
"EG$EG$"PHHHHH"E8$STRING$(4,8)AG
$AH$"2L"A8$AH$"'"A9$Q4$"@"E0$S1$
G0$E0$H0$A$A2$A4$AE$AH$AG$" P"F8
$EN$A8$A7$:PRINT#M,S7$BY$"%"Q4$A
7$AO$S1$G0$A3$A4$A3$AU$H0$Q2$N$E
0$"@@@@@"DV$E0$D0$EP$"FA "EG$"H(
"AK$AK$AK$HK$HS$
6310 PRINT#M,S7$BY$AU$Q2$Q$A3$AK
$DV$Q1$Z1$Q1$G0$AX$HU$Q8$A7$"9"G
E$HG$DV$A1$AE$G3$"8"A7$:PRINT#M,
S7$BY$AU$Q1$S$Q1$Z1$Q2$H0$G0$QA$
Q1$H0$"@"E0$A4$DS$EO$H0$Q$A1$HU$
:PRINT#M,S7$BY$AT$Q2$G0$AO$HO$QB
$Q2$HS$AO$H0$
6340 T=21:GOSUB10:PRINT#M,TAB(58
)S7$AR$"5"AR$"E";:GOSUB28:PRINT#
M,TAB(58)S6$;:GOSUB29:PRINT#M,""
:PRINT#M,TAB(60);:GOSUB28:PRINT#
M,TAB(59);:GOSUB29:PRINT#M,S4$"m
i":PRINT#M,TAB(55);:GOSUB28:PRIN
T#M,TAB(54);
6350 PRINT#M,BW$"$"Q7$STRING$(4,
4)AE$AE$E$E$E$E$H$STRING$(4,4)QA
$S3$"re":PRINT#M,"":PRINT#M,TAB(
55)"do":T=19:GOSUB10:PRINT#M,TAB
(59)BW$"6"Q1$STRING$(54,40):PRIN
T#M,EC$;:NEXTCN:GOSUB90
7000 CY$="CREDIT":GOSUB35:PRINT@
192,"*4. REVERSE PAPER STRIP; IN
SERT      PAPER'S TAIL END IN PRI
NTER.":PRINT@256,"*5. ADVANCE PA
PER TO PLACE FIRST    CREASE AT
RIBBON GUIDE TOP.";:GOSUB70:PRIN
T#M,AR$"2":T=56:GOSUB10
7020 FORCN=1TONC:GOSUB3:PRINT#M,
AR$"@"AF$AR$"G"
7030 PRINT#M,SB$S3$AR$"S"A1$"COM
PUTER GENERATED CARD":PRINT#M,TA
B(CX)"PRINTED BY: "PC$:PRINT#M,E
C$;:NEXTCN
8990 CLS:IFNC>1THENPRINT@161,NC"
CHRISTMAS CARDS ARE DONE."ELSEPR
INT@163,NC"CHRISTMAS CARD IS DON
E.":GOSUB91
8995 END
9000 CLS:PRINT" CHRISTMAS CARD
MULTICOLOR ART":PRINT@66,"THIS P
ROGRAM PRINTS COLOR XMAS CARDS O
N PRINTERS LISTED IN REM LINE 1.
 1 TO 25 FANFOLD COPIES  MAY BE
PRINTED DURING THE PRINT RUNS. P
APER STRIP  MUST BE RE-
9010 PRINT" INSERTED  AND SET TO
 THE SAME   START POINT BEFORE E
ACH COLOR
9020 PRINT" PRINT RUN. FOLLOW IN
STRUCTIONS  DISPLAYED BEFORE PRI
NT RUNS.    FIRST INSTRUCTIONS
APPEAR WHEN CODED STRINGS  ARE D
EFINED AND  STORED. DO NOT TURN
PRINTER ON  OR OFF EXCEPT WHEN I
NSTRUCTED.
9060 Q1$=CHR$(0):A1$=CHR$(1):A2$
=CHR$(2):A3$=CHR$(3):A4$=CHR$(4)
:A5$=CHR$(5):A6$=CHR$(6):A7$=CHR
$(7):A8$=CHR$(8):A9$=CHR$(9):AC$
=CHR$(12):AD$=CHR$(13):AE$=CHR$(
14):AF$=CHR$(15):A$=A1$+A1$:B$=A
3$+A3$
9070 AG$=CHR$(16):AH$=CHR$(17):A
I$=CHR$(18):AJ$=CHR$(19):AK$=CHR
$(20):AL$=CHR$(21):AM$=CHR$(22):
AN$=CHR$(23):AO$=CHR$(24):AP$=CH
R$(25):AQ$=CHR$(26):AR$=CHR$(27)
:AX$=CHR$(28):AT$=CHR$(29):AU$=C
HR$(30):AV$=CHR$(31):C$=A7$+A7$:
D$=AF$+AF$
9080 D0$=CHR$(96):B2$=CHR$(34):E
$=AV$+AV$:F$="??":CR$=CHR$(91):C
S$=CHR$(92):CT$=CHR$(93):CU$=CHR
```

attention

Canadians!

Seasons Greetings to all Canadian Color Computer Owners and Dealers

We wish to thank all of our Retail and Wholesale Customers for their support during the past year. It has been a year of growth for us and we have greatly improved our production and publishing facilities. We now employ full-time artists and programmers to assist Canadians with their software selections and the publishing of Canadian programs.

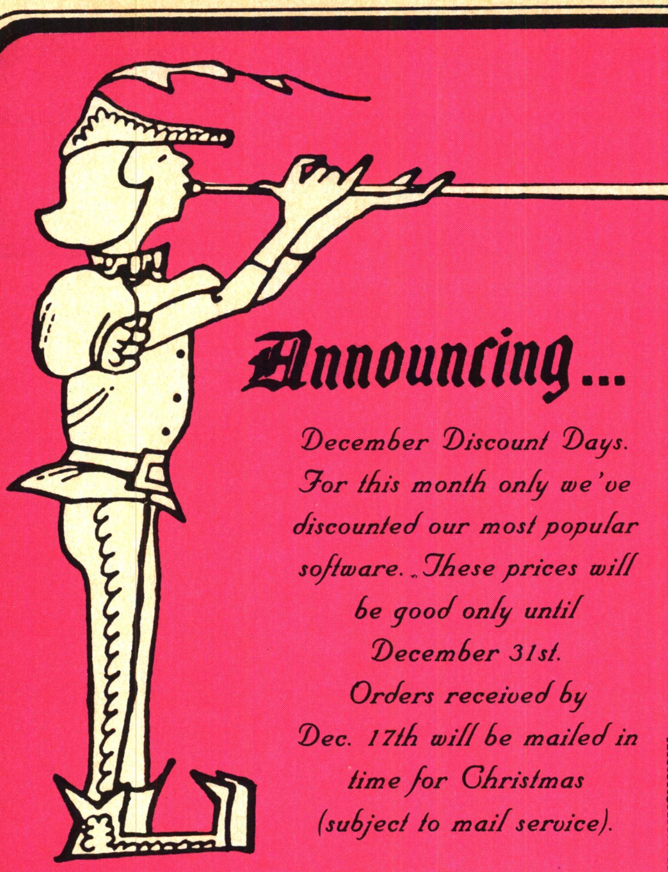
We currently manufacture and distribute over 500 programs for most of the major U.S. publishing firms: Aardvardk, Cer-Comp, Colorsoft Software, Computerware, Double-density Software, Elite Software, Jarb Software, Mark Data Products, Michtron, Moreton Bay Software, Dr. Preble's Programs, Petrocci Freelance, Prickly-Pear Software, Spectral Associates, Spectrum Projects, Speech Systems, Sugar Software and many other fine firms. We also distribute Rainbow Magazine and Rainbow on Tape to Canadian dealers in Canada.

We are a machine specific company and we run our business totally on Color Computers, so we are able to help you with any problems or questions about using your Color Computer for fun or business. Canadians can avoid most customs problems, duty, and taxes by buying here in Canada. Please send for a free copy of our latest Christmas catalogue and Newsletter. We would be pleased to add you to our mailing list. We also invite all Canadian Color Computer Software dealers to send for our dealer catalogue and price list. All of us here at Kelly Software wish everyone a very Merry Christmas and a Good New Year

Kelly Software Distributors Ltd.

P.O. Box 11932
Edmonton, Alberta - T5J 3L1
Tel: (403) 421-8003

```
$(94):CV$=CHR$(95):DR$=CHR$(123)
:DS$=CHR$(124):DT$=CHR$(125):DU$
=CHR$(126):DV$=CHR$(127)
9090 E0$=CHR$(128):E1$=CHR$(129)
:E2$=CHR$(130):E3$=CHR$(131):E4$
=CHR$(132):E5$=CHR$(133):E6$=CHR
$(134):E7$=CHR$(135):E8$=CHR$(13
6):E9$=CHR$(137):EA$=CHR$(138):E
B$=CHR$(139):EC$=CHR$(140):ED$=C
HR$(141):EE$=CHR$(142):EF$=CHR$(
143)
9100 EG$=CHR$(144):EH$=CHR$(145)
:EI$=CHR$(146):EJ$=CHR$(147):EK$
=CHR$(148):EL$=CHR$(149):EM$=CHR
$(150):EN$=CHR$(151):EO$=CHR$(15
2):EP$=CHR$(153):EQ$=CHR$(154):E
R$=CHR$(155):ES$=CHR$(156):ET$=C
HR$(157):EU$=CHR$(158):EV$=CHR$(
159)
9110 F0$=CHR$(160):F1$=CHR$(161)
:F2$=CHR$(162):F3$=CHR$(163):F4$
=CHR$(164):F5$=CHR$(165):F6$=CHR
$(166):F7$=CHR$(167):F8$=CHR$(16
8):F9$=CHR$(169):FA$=CHR$(170):F
B$=CHR$(171):FC$=CHR$(172):FD$=C
HR$(173):FE$=CHR$(174):FF$=CHR$(
175)
9120 FG$=CHR$(176):FH$=CHR$(177)
:FI$=CHR$(178):FJ$=CHR$(179):FK$
=CHR$(180):FL$=CHR$(181):FM$=CHR
$(182):FW$=CHR$(183):FO$=CHR$(18
4):FP$=CHR$(185):FQ$=CHR$(186):F
R$=CHR$(187):FS$=CHR$(188):FT$=C
HR$(189):FU$=CHR$(190):FV$=CHR$(
191)
9130 G0$=CHR$(192):G1$=CHR$(193)
:G2$=CHR$(194):G3$=CHR$(195):G4$
=CHR$(196):G5$=CHR$(197):G6$=CHR
$(198):G7$=CHR$(199):G8$=CHR$(20
0):G9$=CHR$(201):GA$=CHR$(202):G
B$=CHR$(203):GC$=CHR$(204):GD$=C
HR$(205):GE$=CHR$(206):GF$=CHR$(
207)
9140 GG$=CHR$(208):GH$=CHR$(209)
:GI$=CHR$(210):GJ$=CHR$(211):GK$
=CHR$(212):GL$=CHR$(213):GM$=CHR
$(214):GN$=CHR$(215):GX$=CHR$(21
6):GP$=CHR$(217):GQ$=CHR$(218):G
R$=CHR$(219):GS$=CHR$(220):GT$=C
HR$(221):GU$=CHR$(222):GV$=CHR$(
223)
9150 H0$=CHR$(224):H1$=CHR$(225)
:H2$=CHR$(226):H3$=CHR$(227):H4$
=CHR$(228):H5$=CHR$(229):H6$=CHR
$(230):H7$=CHR$(231):H8$=CHR$(23
2):H9$=CHR$(233):HA$=CHR$(234):H
B$=CHR$(235):HC$=CHR$(236):HD$=C
HR$(237):HE$=CHR$(238):HF$=CHR$(
239)
9160 HG$=CHR$(240):HH$=CHR$(241)
:HI$=CHR$(242):HJ$=CHR$(243):HK$
=CHR$(244):HL$=CHR$(245):HM$=CHR
$(246):HN$=CHR$(247):HO$=CHR$(24
8):HP$=CHR$(249):HQ$=CHR$(250):H
R$=CHR$(251):HS$=CHR$(252):HT$=C
HR$(253):HU$=CHR$(254):Z1$=CHR$(
255)
9170 S1$=CHR$(32):S2$=S1$+S1$:S3
$=S2$+S1$:S4$=S3$+S1$:S5$=S4$+S1
$:S6$=S5$+S1$:S7$=S6$+S1$:S8$=S7
$+S1$:S9$=S8$+S1$:SA$=S9$+S1$:SB
$=SA$+SA$:SC$=SB$+SA$:G$=DV$+DV$
:H$=HU$+HU$:I$=HS$+HS$
9180 Q2$=Q1$+Q1$:Q3$=Q2$+Q1$:Q4$
=Q3$+Q1$:Q5$=Q4$+Q1$:Q6$=Q5$+Q1$
:Q7$=Q6$+Q1$:Q8$=Q7$+Q1$:Q9$=Q8$
+Q1$:QA$=Q9$+Q1$:QB$=QA$+QA$:QC$
=QB$+QA$:QD$=QC$+QA$:QE$=QD$+QA$
:J$=HO$+HO$:K$=HG$+HG$:L$=H0$+H0
$:M$=G0$+G0$:N$=E0$+E0$
9190 Z2$=Z1$+Z1$:Z3$=Z2$+Z1$:Z4$
=Z3$+Z1$:Z5$=Z4$+Z1$:Z6$=Z5$+Z1$
:Z7$=Z6$+Z1$:Z8$=Z7$+Z1$:Z9$=Z8$
+Z1$:ZA$=Z9$+Z1$:ZB$=ZA$+ZA$:ZC$
=ZB$+ZA$:ZD$=ZC$+ZA$:ZE$=ZD$+ZA$
:M=-2
9200 BY$=AR$+"K":LY$=AR$+"A"+A8$
:BW$=AR$+"L":PRINT@483,"PRESS <S
PACEBAR> TO START.";:EXEC44539
9210 CLS:PRINT:PRINT:INPUT" HOW
MANY CARDS TO BE PRINTED";NC:PRI
NT@96," (YOU'LL NEED"NC+2"FANFOL
D SHEETS)
9220 PRINT@193,"HOW SHALL I SIGN
 THE CARDS?":INPUT" (ENTER UP TO
 26 CHARACTERS.)    ";NC$:NX=76-
LEN(NC$)
9230 PRINT@353,"WHO GETS CARD-PR
INTING CREDIT?":INPUT" (ENTER UP
 TO 24 CHARACTERS)     ";PC$
9240 CX=LEN(PC$):CX=INT((70-(CX+
12))/2)
9250 CLS:GOSUB30:PRINT@65,"1. VE
RIFY THAT PRINTER IS OFF.  2. PU
T RED RIBBON IN PRINTER.   3. FE
ED START END OF FANFOLD       PA
PER STRIP INTO PRINTER.    4. AD
VANCE PAPER TO PUT FIRST      FA
NFOLD CREASE 1/8 INCH BE-     LO
W RIBBON GUIDE'S TOP EDGE
9260 PRINT@289,"5. INDEX MARK PA
PER'S RIGHT        EDGE AT FIXED
 INDEX MARK.    6. TURN PRINTER
POWER ON.       7. PRESS <P> KEY
 TO START THE      FIRST COLOR P
RINT RUN.":GOTO1000
```



Announcing...

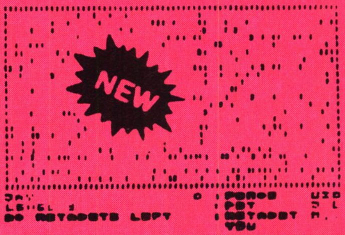
December Discount Days. For this month only we've discounted our most popular software. These prices will be good only until December 31st. Orders received by Dec. 17th will be mailed in time for Christmas (subject to mail service).

Megamunk

100% machine language fast action game. As a soldier / monkey you must save the forest of Ledonia from the evil mammoth spiders, avoid the falling coconuts, save the sacred birds and recover Ledonia's treasure. Megamunk has 11 different screens with multiple colors and "four voice" music. Joysticks required.

32K cassette .... ~~$21.95~~
32K disk .... ~~$23.95~~

$17.95



METABOT

100% machine language strategy game. You are surrounded by Metabots. Each time you take a step, they each take a step. You must lure them into the electric fences and acid pots. Great fun for ages 8 and up. The whole family can play! Joysticks **NOT** required.

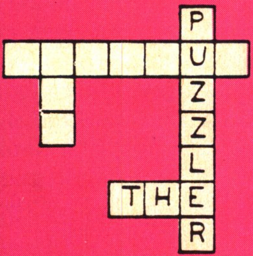
32K cassette .... ~~$18.95~~
32K disk .... ~~$20.95~~

$15.95

DIET-AID will help you track your calorie intake, tell you how many calories you need to maintain your weight & suggest how much exercise you need to burn up any extra calories you've consumed.

32K Cassette ...... ~~$19.95~~

$16.95



THE PUZZLER will create crossword puzzles, wordsearch puzzles and wordscramble puzzles. Will print the puzzle with any dot addressable printer (printer optional). 100% machine language. Incredible!

16K Cassette . ~~$21.95~~
32K Disk .... ~~$23.95~~

$19.95

MATCH & SPELL turns spelling drudgery into spelling fun
16K Extended Basic .. ~~$11.95~~
$8.95

MATHWAR is a 1st and 2nd grade math drill game
16K Extended Basic .. ~~$11.95~~
$8.95

FLASHCARDS assists in studying anything from Mythology to Medicine. 16K Extended Basic .. ~~$11.95~~
$8.95

TIC-TAC-TOE MATH. Plenty of color and sound. Different age players can compete against each other with their own skill level. 16K Extended Basic .. ~~$11.95~~
$8.95

PRE-SCHOOL PAK. Alphabet recognition and counting drills. Hi-res graphics and sound.
16K Extended Basic .. ~~$14.95~~
$10.95

QUIZ ALL. A versatile quiz program. Has study and test formats and allows printing of quiz. Even includes an option for CoCo to generate multiple choice answers.
16K Extended Basic . . . ~~$18.95~~
16K Disk .... ~~$20.95~~
$15.95

AMORTIZATION. This is the most complete, most versatile amortization program available for the CoCo.
16K Extended Basic .. ~~$11.95~~
$8.95

ORDERING INFORMATION:

- Add $2 for shipping and handling
- Utah residents add 5.75% sales tax
- We accept checks, money orders, VISA and MASTER CHARGE
- Order by phone — 801-571-5023 (call 6:30 to 10 pm MST for technical info)
- Add $2 for COD orders

Dog-gone it.
I wish I could play
Megamunk!

master charge OR VISA

COLOR CONNECTION SOFTWARE

1060 Buddlea Drive—Sandy, Utah 84070—801-571-5023

16K
DISK

Cooking With CoCo

Part VI

By Colin J. Stearman

If you think CoCo is without parallel, this month we cook up something to prove you right and wrong!

I love my printer. It prints quickly, it prints letter quality, it draws pictures, I can send it my own character fonts . . . but the darn thing has a parallel port and CoCo has a serial printer output. Sure I can buy a serial interface for it but it's over 25 percent of the cost of the printer alone, and I hate to waste money. The only solution is to design a parallel port for CoCo.

The actual design is easy, but I wanted the software to fully integrate the port into BASIC, allowing me to direct printer output to either the parallel port or the existing serial port; and for good measure I wanted the BASIC to allow easy adjustment of the Baud rate on the serial port.

To achieve all this meant adding initialization code for the parallel port hardware, trapping output destined to go to the serial port and redirecting it to the desired printer port. This month's assembly language listing does all that as well as adding three new BASIC commands. If you do not need this parallel port and are thinking of turning to the next article, two of the new commands apply to the existing serial port also, so maybe you might want to stick around.

But before we get to the software, let's get the hardware built. If you didn't have trouble with the EPROM programmer, this project will be a snap.

Adding The Parallel Port

The object of the construction is to mount a new 6821 PIA (peripheral interface adapter) inside the computer, without making irreversible modifications to the circuit board. I did this by "piggybacking" the new PIA onto U4. The photos of my unit should give you an overall idea of the look of the finished unit.

U4 is an existing PIA used to drive the D/A converter and control the VDG chip. Please note that these modifications refer to the REV E-style motherboard. If you have a later model, your PIA may not be labeled U4 and will have to be identified by the function it performs.

To construct the unit, first gather the following components together:

1) 6821 PIA Peripheral Interface Adapter
2) Breadboard PCB Radio Shack #276-158

3) SN7404 Hex Inverter Radio Shack #276-1802
4) 40 Pin IC socket, wire-wrap type
5) Thin hook up wire
6) Flat ribbon cable, 36 conductor wide
7) Centronics-type female plug, ribbon mounting

Items 1, 4, 6 and 7 are not carried by Radio Shack but are available via mail order from Active Electronics, Westboro, Mass. and other sources. The IC socket must be the wire-wrap type.

To assemble the parts, first remove the cover from CoCo and also the RF shield lid inside. Locate U4 (REV E board #), the 6821 on the right as you face CoCo. Gently pry the IC out of its socket, using a small screwdriver or IC puller. Be careful not to damage the pins. Put CoCo to one side as we will now construct the "piggyback" board assembly.

Mount the 40-pin socket to the PCB (printed circuit board, item 3) anywhere convenient, but leave room for the SN7404 near pin 24. Solder all pins on the socket to the PCB, but *do not* cut off the excess.

Take the new 6821 and gently bend pin 24 outward a little so that when the IC is put into the socket, this pin will not enter it. Put the IC in the socket and press it home.

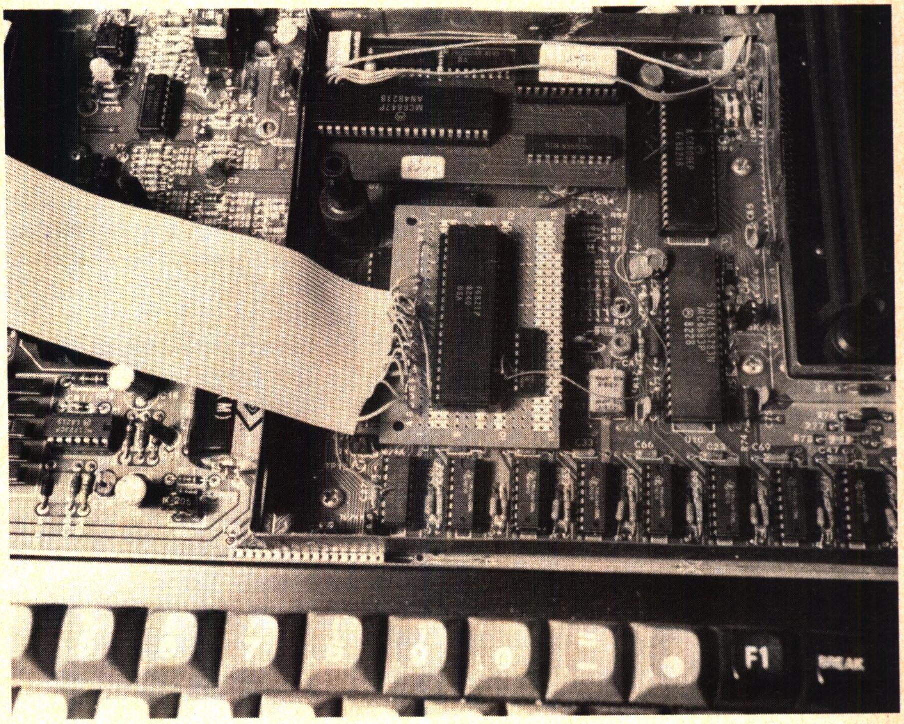
Mount the SN7404 alongside the 6821 near pin 24. Solder all pins to the PCB. Using the hookup wire, connect pins 1, 3, 5, 7, 9 and 11 together and also to pin 20 of the 40-pin socket. Connect pin 14 to pin 1 on the 40-pin socket. Connect pin 13 to pin 24 of the 6821. This is the bent pin not inserted into the socket. Also connect this pin to a length of wire about nine inches long. The other end will be connected later. Connect pin 12 to the 40-pin socket pin 24.

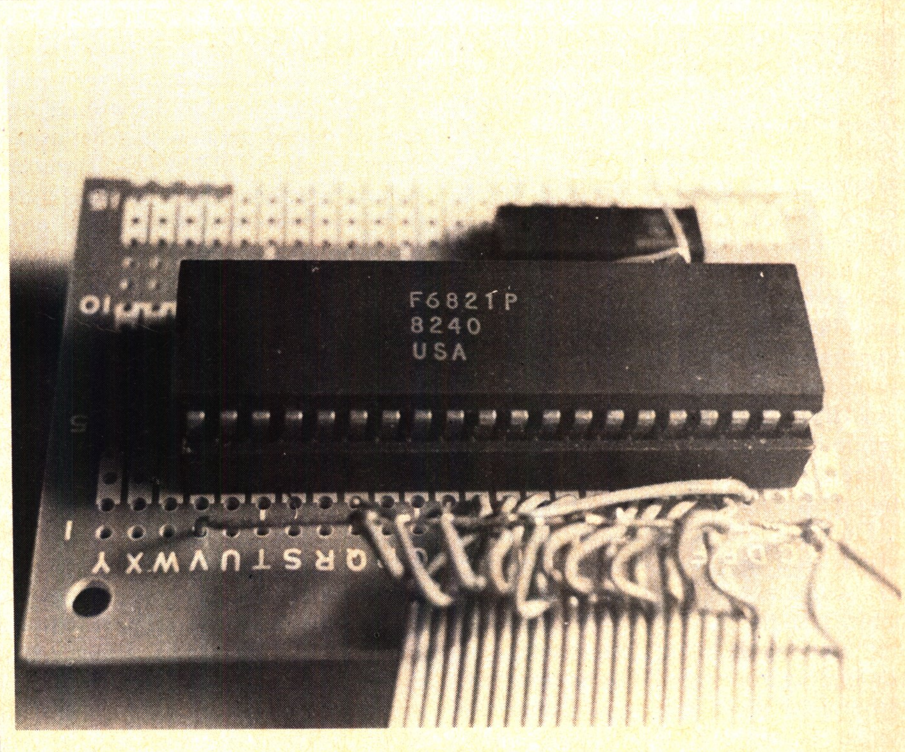
Turn the PCB upside down and cut off the wire-wrap pins from pins 2 through 19 only. Cut them as close as possible to the PCB. The next task is to mount the assembly on top of the 6821 removed from U4.

Locate the 6821 removed earlier from CoCo and carefully bend pin 24 so it points vertically upward. Position the assembly on top of this IC to test for fit. It may be necessary to splay the wire-wrap pins out a little. In order for the finished assembly to fit under the RF shield lid, the remaining wire-wrap pins must be trimmed as short as possible. Gauge how much you can cut from each pin and then trim all to this height.

Now solder the assembly to the 6821, soldering each wire-wrap pin to its respective pin on U4. You should be connecting to U4 pins 1, 20, and 21 through 40. The wire-wrap pin 24 will connect to the upturned pin 24 on U4. This pin will not connect to the socket when U4 is returned to the CoCo motherboard. When soldering the assembly to the back of U4, minimize the amount of solder used so that the IC will still fit into its socket. Also position the solder joint high on the pins so that the lower part will still fit the socket.

Finally, the ribbon cable must be attached to the assembly. Consult your printer manual and Figure 1. The best approach is to fit the Centronics socket to the ribbon cable to aid in identifying the wire numbers. Most sockets have the numbers molded into them. On the





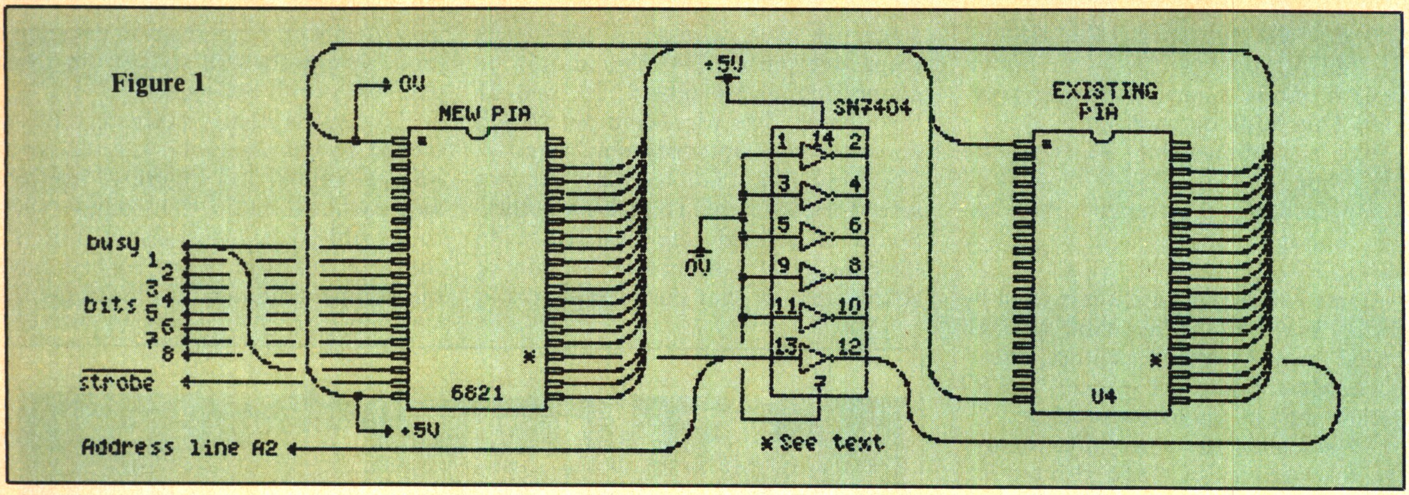


Figure 1

standard parallel interface the wires and their functions are:

Wire	Function
1	Data Strobe (bar)
2	Data Bit 1
3	Data Bit 2
4	Data Bit 3
5	Data Bit 4
6	Data Bit 5
7	Data Bit 6
8	Data Bit 7
9	Data Bit 8
11	Busy
14	Signal Ground

Connect the wires to the pins as indicated in Figure 1. Wire 14 should be connected to any 0V point on the assembly. Finally trim all the excess PCB from the assembly to minimize its size.

Now mount the finished assembly into CoCo. Press the lower IC gently but firmly into the U4 socket. All pins of the lower 6821 must enter the socket, except for pin 24 which was bent upwards. It's not easy to see that this happens, so inspect the results carefully. The assembly should be firm and quite rigid when installed.

The wire still left unattached must be soldered to the main computer board near the 6809. Cut this wire to a suitable length and attach to the solder point, as indicated in Figure 2. Use a light solder tack to minimize the possibility of damage to the board. This wire picks up address Line 2 to allow the software to distinguish between the two PIAs.

The ribbon cable will head toward the left as you face CoCo. Take the RF shield lid and bend the fingers where the cable is, so the lid can be replaced without pinching the wire. If the assembly is too high to allow the lid to be replaced, either leave it off entirely, or extend the height of the RF shield using some shielding metal from an old TV.

The ribbon cable can be routed out of the computer by doubling it back on itself and running it under the main circuit board. A notch cut in the lower plastic shell underneath the serial and cassette ports will allow the cable to leave the case.

This completes the hardware construction. We now move on to this month's software additions to the Disk BASIC patch.

The New BASIC Commands

This month we add three new commands, all associated with the printer port. Two apply even if you do not intend building the parallel port, so stick with us.

PARALLEL

Issuing the BASIC command PARALLEL, either directly from the keyboard, or within a program will result in all data destined for the printer being routed out of the new parallel port. In other words, all *PRINT#-2* statements will output through the parallel port.

The code to drive the parallel port is conditional assembled based upon whether a variable called *PARPNT* is defined or not. Review the paragraph in September's issue for more details on how to include or exclude the code for the parallel port, as desired.

BAUD

This command applies whether or not you have the parallel port. Either way, it establishes the Baud rate of the serial port. If you have the parallel port, it also activates the serial port so that all *PRINT#-2* commands direct output through the standard serial port. The original serial driver code in the Color BASIC ROM is still used for the serial port.

The syntax for this command is:

```
BAUD(n)
```

where n = 300, 600, 1200, 2400, 4800 or 9600.

If you have the parallel port, then CoCo starts up with this activated. If you do not, then the serial port is activated and set at 600 Baud.

LDIR

A simple but useful command which does a normal directory but directs it to the currently active printer port. The directory contains the creation date enhancement, but, of course, does not pause after each 16 lines, as when directed to the screen.

Adding This Month's Code

As last month, use your editor to pull in the source code built up so far. Delete the lines identified with reference numbers 20, 21, 22, and 29. Read and follow the notes at reference Lines 6, 7, 8, 10 and 11 regarding including or excluding the parallel port code.

Go to the end of the listing and delete all the remaining lines from and including *ZZLAST EQU *-1*. Then add the assembly text in Listing 1. When all is set, re-assemble the resulting file and test as you have in previous months.

To test the parallel port, connect it to a printer and try *LLISTing* a BASIC program or run some other program which has printer output. If it does not work, but the computer works otherwise, double check your wiring on the new PIA, especially around the ribbon cable connection point. It's very easy to miscount the wires.

A Final Point

All BASIC programs will have no trouble sending output to the parallel port. However, you may have trouble with some machine language programs. If they use the serial port in the Color BASIC ROM and do not "mess" with the hooks in RAM, the port should work alright. If the program has Baud rate control, set it to 110 or 120 and this will activate the parallel port; 300 or higher will activate the serial port.

If you have FHL FLEX then you can use the parallel port driver routine described in the FLEX manual. The reason that the BUSY line goes to both pins 9 and 19 on the new PIA is specifically to accommodate the approach these routines use to detect the printer busy condition. From a programmer's point of view, the PIA is addressed as follows:

FF24 Bit 0 - 6 unused
Bit 7 printer busy line

FF25 Control port for above (set to $4)

FF26 Bit 0 - Parallel port bit 1
Bit 1 - Parallel port bit 2
Bit 2 - Parallel port bit 3
Bit 3 - Parallel port bit 4
Bit 4 - Parallel port bit 5
Bit 5 - Parallel port bit 6
Bit 6 - Parallel port bit 7
Bit 7 - Parallel port bit 8

FF27 Bit 0 - 0
Bit 1 - 0
Bit 2 - 1

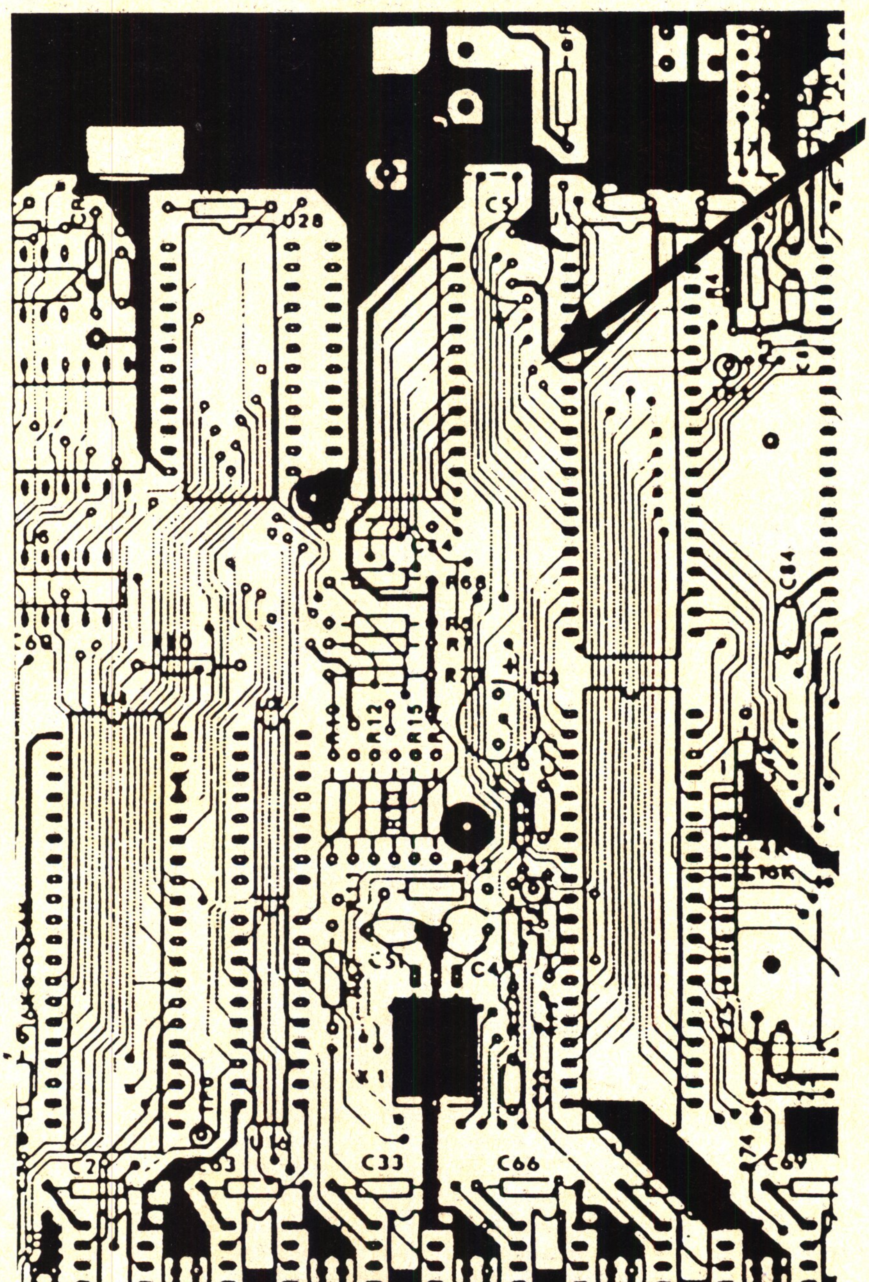


Figure 2

Attach address Line 2 wire from parallel port to this point on Rev 'E' boards.

On other revision boards, locate the trace from Pin 10 on the 6809 microprocessor.

Bit 3 - STROBE (BAR)
Bit 4 - 1
Bit 5 - 1
Bit 6 - not used
Bit 7 - BUSY FLAG (1 when not busy)

This should provide the information you need to incorporate the parallel port into FLEX. Drop me a line if you have trouble.

Coming Attractions

One of the glaring omissions from BASIC is its ability to trap and deal with system errors in a graceful way. We will add this trapping, along with fully spelled out error messages, both on the screen as well as available in a string variable; plus variables identifying the type of error and the line number it occurred.

If you would like the entire *DOS-PATCH* program source, along with binary files with and without the parallel port driver for DECB 1.0 and DECB 1.1, just send me a disk (no cassettes please) along with $6 and a stamped, addressed disk mailer. I will load the disk and return it to you promptly. Address this request or any questions to Colin Stearman, 143 Ash Street, Hopkinton, MA 01748.

The listing:

```
                1087        OPT   LIS
                1088 ********************************************
                1089 *  PATCH #4 to RSDOS (C)1984 Colin Stearman *
                1090 ********************************************
                1091 *
                1092 * "BAUD" COMMAND CODE
                1093 * SYNTAX IS BAUD(N) WHERE N =
                1094 * 300,600,1200,2400,4800,9600
                1095 *
DC5E BE         1096 BDCNST FCB   $BE,$57,$29,$12,$6,$1 300,600,1200,2400
                1097 *                     4800,9600 BAUD CONSTANTS
                1098 *
                1099 *
DC64 BDB262     1100 BAUD   JSR   $B262       EVAL BRKT ARGUMENT
DC67 BDB740     1101        JSR   $B740       GET INTEGER IN X
DC6A 6FE2       1102        CLR   ,-S         FOR COUNTER
DC6C 1F10       1103        TFR   X,D         GET BAUD VALUE
DC6E 10832580   1104        CMPD  #9600       HIGHEST LEGAL VALUE
DC72 1022FBC3   1105        LBHI  FCERR       ERROR IF HIGHER
DC76 6CE4       1106 CNTBD  INC   ,S          COUNT SUBTRACTION
DC78 83012C     1107        SUBD  #300        DIVIDE BAUD BY 300
DC7B 102BFBBA   1108        LBMI  FCERR       NOT A VALID VALUE
DC7F 26F5       1109        BNE   CNTBD       CONTINUE SUBTRACTION
                1110 * GOT A VALID MULTIPLE OF 300
DC81 3502       1111        PULS  A           GET RESULT
DC83 5F         1112        CLRB              POWER COUNTER
DC84 8EDC5E     1113        LDX   #BDCNST     POINT X TO BAUD CONSTANTS
DC87 44         1114 SFTAGN LSRA              BIT INTO CARRY
DC88 2503       1115        BCS   GETCON      GOT BIT GET CONSTANT
DC8A 5C         1116        INCB              COUNT SHIFT
DC8B 20FA       1117        BRA   SFTAGN      GO SHIFT AGAIN
DC8D A685       1118 GETCON LDA   B,X         GET BAUD RATE
DC8F 9796       1119        STA   BAUDRT      SET BAUD RATE
DC91 0F95       1120        CLR   BDFLAG      CLEAR TO ENABLE SERIAL PORT
                1121 *                  AND SET LSB OF BAUD RATE
                1122 *
DC93 39         1123        RTS               ALL DONE
                1124 *******************************************
                1125 *   "LDIR" COMMAND, PRINT DIRECTORY
                1126 *
DC94 C6FE       1127 LDIR   LDB   #-2         POINT DEVNUM TO PRINTER
DC96 D76F       1128        STB   DEVNUM
DC98 7ECBCF     1129        JMP   A0016       DO DIR COMMAND
                1130 *******************************************
                1131        IFDF  PARPRT      ASSEMBLE FOR PARALLEL PORT
                1132 *
                1133 * "PARALLEL" COMMAND CODE AND OUTPUT ROUTINE
DC9B CC01CA     1134 PARA   LDD   #$1CA       120 BAUD DELAY
                1135 *                    SET MSB TO 1 FOR PARALLEL PORT
DC9E DD95       1136        STD   BDFLAG      TO MAKE PARALLEL ACTIVE
DCA0 39         1137        RTS
                1138 **********
                1139 * Parallel port output routine
                1140 * This is called by the modified jump at $168
DCA1 0D95       1141 PAROUT TST   BDFLAG      IF NOT ZERO THEN PARALLEL
DCA3 1027EEA3   1142        LBEQ  A0015       DO SERIAL OUTPUT
DCA7 3402       1143        PSHS  A           SAVE VALUE
DCA9 966F       1144        LDA   DEVNUM      GOING TO DEVICE -2?
DCAB 81FE       1145        CMPA  #-2
DCAD 3502       1146        PULS  A           RECOVER CHAR, FLAGS DONT CHANGE
DCAF 1026EE97   1147        LBNE  A0015       NOT DOING DEVICE #-2
                1148 *
                1149 * PARALLEL OUTPUT WANTED
DCB3 810D       1150        CMPA  #$0D        WAS IT A CR?
DCB5 2703       1151        BEQ   WASCR
DCB7 0C9C       1152        INC   <$9C        INCREMENT LINE PRINT POSITION
DCB9 8C         1153        FCB   $8C         SKIP NEXT 2 BYTES
DCBA 0F9C       1154 WASCR  CLR   <$9C        LINE COUNTER
DCBC 3411       1155        PSHS  CC,X        PRESERVE BASIC VALUES
DCBE 8EFF26     1156        LDX   #DATA       POINT X TO PIA
DCC1 6D1E       1157 CHKRDY TST   -2,X        BUSY IF LINE 7 HI
DCC3 2BFC       1158        BMI   CHKRDY      WAIT UNTIL LOW
DCC5 A784       1159        STA   ,X          DATA REGISTER
DCC7 3511       1160        PULS  CC,X        RECOVER VALUES
DCC9 3262       1161        LEAS  2,S         OLD RETURN OFF STACK
DCCB 39         1162        RTS               TO ORIGINAL CALLER
                1163 *********
                1164        ENDC
                1165        OPT   LIS
                1166
                1167
DCCB            1168 ZZLAST EQU   *-1         last used address value
                1169 *
                1170 * ZZLAST must not be greater than $DFFF for
                1171 * DOS 1.0 and $DEFF for DOS 1.1.   The latter
                1172 * has the OS-9 Boot program and SWI set routines
                1173 * from $DF00 to $DF4C
                1174 *
                1175 *
                1184        OPT   LIS
D994            1185        END   ADDCOM
         NO ERROR(S) DETECTED
```

Submitting Material To the Rainbow

Contributions to THE RAINBOW are welcome from everyone. We like to run a variety of programs which will be useful/helpful/fun for other CoCo owners.

Program submissions must be on tape or disk and it is best to make several saves, at least one of them in ASCII format. We're sorry, but we do not have time to key in programs. All programs should be supported by some editorial commentary, explaining how the program works. We're much more interested in how your submission works and runs than how you developed it. Programs should be learning experiences.

We do pay for submissions, based on a number of criteria. Those wishing remuneration should *so state* when making submissions.

For the benefit of those who wish more detailed information on making submissions, please send a SASE to: Submissions Editor, THE RAINBOW, P.O. Box 385, Prospect, KY 40059. We will send you some more comprehensive guidelines.

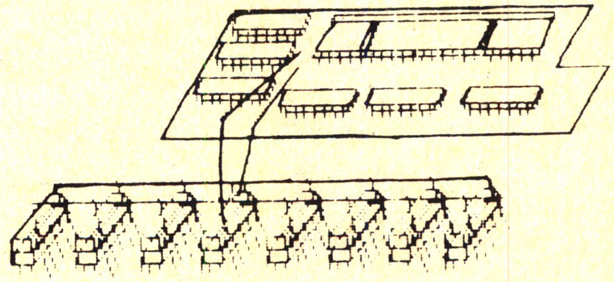
Please do not submit programs or articles currently submitted to another publication.

128K

THE EASY WAY

SOLDERLESS MOD FOR

ALL 64K COCOS*



ONLY $99.00

INCLUDES ADDITIONAL 64K OF RAM

LOGIC BOARD WITHOUT 64K RAM ONLY $34.95

* ADAPTOR FOR D, E, AND COCO 2 $9.95 EXTRA

GAMES

PICTURE PUZZLE	9.95 (C) 12.95 (D)
TRAPFALL	27.95 (C)
AIR TRAFFIC CONTROLLER	28.95 (C)
GRABBER	27.95(C)
DEVIL ASSAULT	27.95 (C)
BUZZARD BAIT	27.95 (C)
THE KING	26.95 (C)
DEATH PLANET	19.95 (C)
ROBOTTACK	24.94 (C)
THE FROG	30.95 (D) 27.95 (C)
STELLAR SEARCH	24.95 (C)
STELLAR SEARCH	27.95 (D)
AIRLINE	24.95 (C)
INATAK	24.95
CASHMAN	27.95 (C)
OUTHOUSE	27.95 (C)
AREX	34.95 (C)
ZAXXON	39.95 (D)
ELEC●TRON	24.95 (C)
WORLD OF FLIGHT	32.95 (D) 29.95 (C)
HYPER ZONE	26.95 (C)
JUNIORS REVENGE	28.95 (C)
BUMPERS	24.95 (C)

HI - RES ADVENTURES

SHENANIGANS	24.94
CALIXTO ISLAND	24.95
BLACK SANCTUM	24.95
TOUCHSTONE	27.95
TIME BANDIT	27.95
KING TUT	29.95
SEA QUEST	24.95

APPLICATION

ELITE-WORD		59.95
ELITE-FILE		74.50
VIP WRITER		59.95
VIP DATABASE		59.95
VIP SPELLER		39.95
VIP TERMINAL		49.95
VIP DISK ZAP		39.95
TELEWRITER	TAPE	49.95
TELEWRITER	DISK	59.95
VIP CALC		59.95

ELECTRONIC CALLIGRAPHER

FOR EPSON/GEMINI, PROWRITER,
OR RADIO SHACK PRINTERS
TWO FONTS OLD ENGLISH &
CHANCERY CURSIVE

DISK ONLY **NOW $18.95**

FULL SCREEN EDITIOR	19.95
PRINTER SPOOLER 64K	9.95
SUPER SCREEN	29.95 (C)
GRAPHIC SCREEN PRINT	
FOR GEMINI	9.95 (C)
FOR EPSON	9.95 (C)
FOR OKIDATA	9.95 (C)
FOR PROWRITER	9.95 (C)
FOR LP VII/RS	7.95(C)

ACCESSORIES

EPSON RIBBONS	7.49
GEMINI RIBBONS	2.95
LP VII, DMP100 RIBBONS	4.95
DISKS	
SENTENIAL SS/SD	19.95
SENTENIAL SS/DD	22.95
VERBATIM	34.95
2 WAY RS232 SWITCHER	29.95
3 WAY RS232 SWITCHER	39.95
CASSETTE CABLE	5.95
64K RAM EMBLEM	2.95
BOTEK INTERFACE	59.95
FOR EPSON	69.95
HJL-57 KEYBOARD	79.95

DSL COMPUTER PRODUCTS INC.

313-582-8930

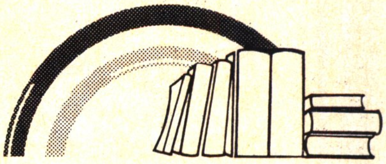
P.O. BOX 1176 DEARBORN, MI 48121

VISA® MasterCard

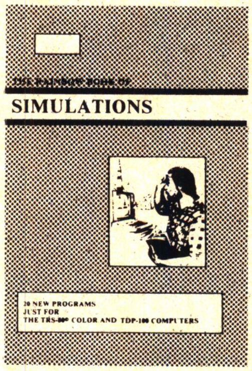
Announcing . . .

The Rainbow Bookshelf

From Falsoft, Inc. a new compilation of books, media and learning aids for the world's most popular computers.



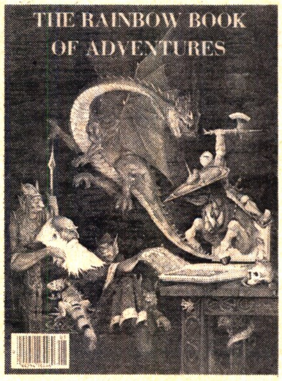
The Rainbow Book of Simulations


THE RAINBOW BOOK OF
SIMULATIONS
20 NEW PROGRAMS JUST FOR THE TRS-80 COLOR AND TDP-100 COMPUTERS

Now . . . 20 super Simulations from the RAINBOW's first simulation contest! Be an air traffic controller . . . worry about flood control . . . be the presidential candidate . . . and a whole lot more!

Book **$9.95**
Tape **$9.95**

The Rainbow Book of Adventures



All 13 winners from the RAINBOW's fabulous 1st Adventure contest! Fight in the depths of the earth . . . work your way through a lighthouse . . . explore a haunted mansion . . . and many more!

Book **$7.95**
Tape **$7.95**

And coming for Christmas . . .

The Complete Rainbow Guide To OS-9!

By Dale Puckett and Peter Dibble

ONLY $19.95

Falsoft, Inc.
9529 U.S. Highway 42
The Falsoft Bldg.
P.O. Box 385
Prospect, KY 40059

Please send me:

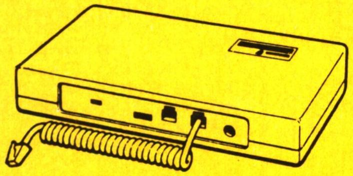
☐ The Rainbow Book of Simulations	$ 9.95	______
☐ Simulation Book Tape	$ 9.95	______
☐ The Rainbow Book of Adventures	$ 7.95	______
☐ Adventure Book Tape	$ 7.95	______
☐ The Complete Rainbow Guide to OS-9	$19.95	______
Add $1 per book Shipping and Handling		______
Total		______

I want to start my own Rainbow Bookshelf!

Name ______________________________
Address ______________________________
City ____________________ State __________ ZIP __________

☐ Payment Enclosed   Charge: ☐ VISA   ☐ MasterCard   ☐ American Express
Account Number ______________ Interbank # (MC Only) ______________
Signature ______________ Card Expiration Date ______________

GET ON LINE FOR $79



AUTOTERM
TURNS YOUR COLOR COMPUTER INTO THE
WORLD'S SMARTEST TERMINAL!
YOU'LL ALSO USE AUTOTERM FOR SIMPLE WORD PROCESSING & RECORD KEEPING.

SIGNALMAN™ COLOR MODEM

REG.$99 ONLY **$59.95**

SPECIFICATIONS

Data Format	Serial, binary, asynchronous		
Operate Mode	Manual dial, Automatic ANSW/ORIG selection		
Data Rate	0 to 300 bps, full duplex		
Modulation	Frequency shift-keyed (FSK)		
Line Interface	Direct-connect		
Data Interface	RS-232C compatible, built-in cable to computer		
Transmit Frequency		ORIG	ANSW
	MARK	1270 Hz	2225 Hz
	SPACE	1070 Hz	2025 Hz
Transmit Frequency Accuracy	± 0.01%		
Transmit Level	-12 dBm typical		
Receive Frequency		ORIG	ANSW
	MARK	2225 Hz	1270 Hz
	SPACE	2025 Hz	1070 Hz
Receive Frequency Tolerance	± 0.5%		
Carrier Detect Threshold	-44 dBm typical		
Carrier Detect Indicator	Audible tone		
Power Requirement	Internal 9V transistor battery * or 110 VAC through adapter *		
Size	$8^{1}/_{4}$" x $4^{3}/_{8}$" x $1^{3}/_{8}$"		

* Not included

```
Cassette  $39.95                    Diskette  $49.95

*  Total Communications Capability
*  Send/Receive Text, Graphics, & ML Programs
*  Scroll, Search, Edit, Load, Save while On Line
*  Built-in Word Processor
*  HI-RES Lower Case is Optional & Fast
*  Screen Widths of 32, 40, 42, 51, & 64
*  Many Printer Options
*  Optional Key-Beep & Error Beebop
*  Automatic Block Graphics
*  Unbelievable Keystroke Multiplier Abilities
```

SPECIAL PACKAGE PRICE

SIGNALMAN MODEM & AUTOTERM

$150 VALUE

ONLY **$79**

A.C.ADAPTER $8.95

SUPER SPECIALS

MEDIA STORAGE DISKETTE

FLIP 'N' FILE 10	$ 4.95
FLIP 'N' FILE 15	$ 7.95
FLIP 'N' FILE 50	$21.95
FLIP 'N' FILE 25 LOCK	$21.95
FLIP 'N' FILE 50 LOCK	$29.95

TWO WAY RS-232 SWITCH	$26.95
SURG SUPPRESSOR 6 OUTLET WITH BREAKER AND SWITCH REG.$69.95	$39.95
HEAD CLEANING KIT (DISK) REG. $29.95	$19.95

COLOR TERM +PLUS+

$29.95 (TAPE) Now even more +PLUS+ features than before!!! $39.95 (DISK)

New and Improved!!

An Intelligent Terminal Program For The Color Computer or TDP 100.

- + Communications BAUD rate: 110-19200
- + Change printer BAUD rate: 600-9600
- + Select printer line feeds if needed
- + Select Half or Full Duplex
- + Select Odd, Even, or No Parity
- + Select 7 or 8 Bit Words
- + Select 1 or 2 Stop Bits
- + Send Control Characters
- + Separate Keys for Escape & Delete (Rubout)
- + Turn off those UGLY Lower-case letters
- + Word Wrap — eliminate all split words
- + Selectable Reverse or Normal Video

THE BEST YOU CAN BUY

COLORCOM/E

SMART TERMINAL PACKAGE

- ★ Complete Upload and Download Support
- ★ Online Cassette/Disk Reads and Writes
- ★ 110, 300, 600, or 1200 Baud
- ★ Full or Half Duplex
- ★ Preenter Data Before Calling (Saves $$'s)
- ★ Offline and Online Scrolling
- ★ ROM Pack or Disk
- ★ Automatic Capture of Files
- ★ Send All 127 ASCII Characters From Keyboard
- ★ Word Mode Eliminates split Words
- ★ 7 or 8 Data Bits (Including Graphics Support)
- ★ Efficient Data Storage S-t-r-e-t-c-h-e-s Memory
- ★ 100% Compatible w/Rainbow Connection BBS's!
- ★ Disk Version-64K and Hi-Res screen now available!

COLORCOM/E $49.95

A GREAT BUY!

ORDERING INFORMATION

ADD $2.00 PER ORDER FOR SHIPPING.
WE ACCEPT VISA, MASTERCARD, CHECKS, M.O.
C.O.D. ADD $3.00 EXTRA.

California Residents, Add 6% Sales Tax to Orders

SALE PRICE GOOD THRU 12/31/84

VISA

SOFTWARE PLUS

MasterCard

6201 C Greenback Lane
(916) 726-8793
Citrus Heights, CA 95610

THE EASY WAY

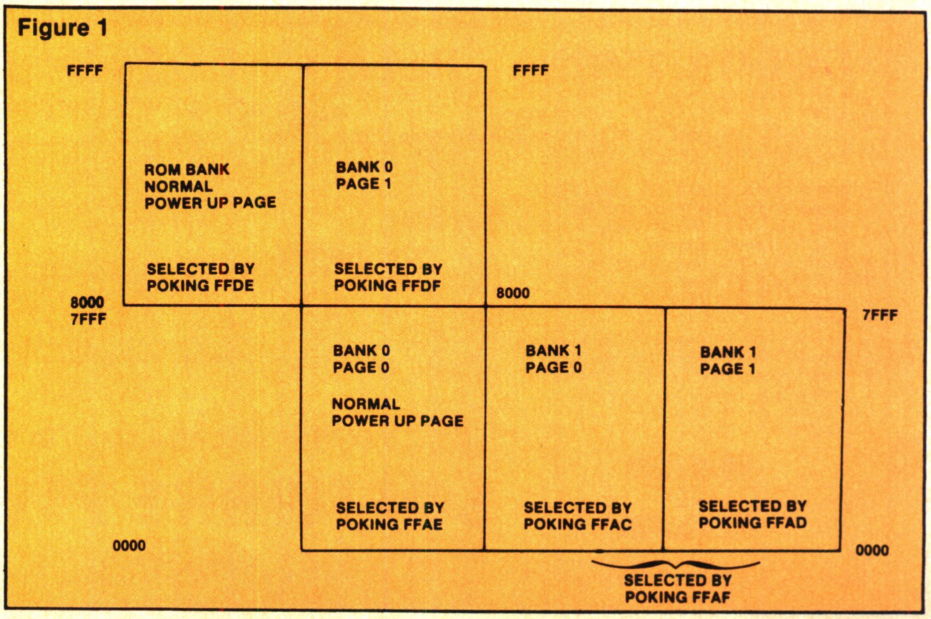
By Dennis Lewandowski

Radio Shack released a Color Computer with 4K, expandable to 16K. That was it; 16K was to be the maximum amount of memory that could be obtained from it. However a rather intelligent gentleman wrote an article in the March 1981 *BYTE* magazine, telling how to piggyback 16K chips and fool the SAM and CPU into seeing 32K.

Rumors flew fast and furious about a 32K memory kit from Radio Shack. It involved the use of partially bad 64K chips. Now the minds at Frank Hogg Laboratories went to work. Using an extra gate already available on the board, they could toggle the upper bank of the 64K chips in and out, thus, making the current 64K Color Computer we have today. Everyone went to work to develop a 128K modification, but the same stumbling block kept getting in the way; the ROM version of BASIC will only support 32K. With prices dropping on computers faster then pig bellies on Wall Street, most research went the way of the horse. Sure, there are a couple of 128K modifications currently available, however the hows and whys are being kept guarded secrets, making software support almost impossible.

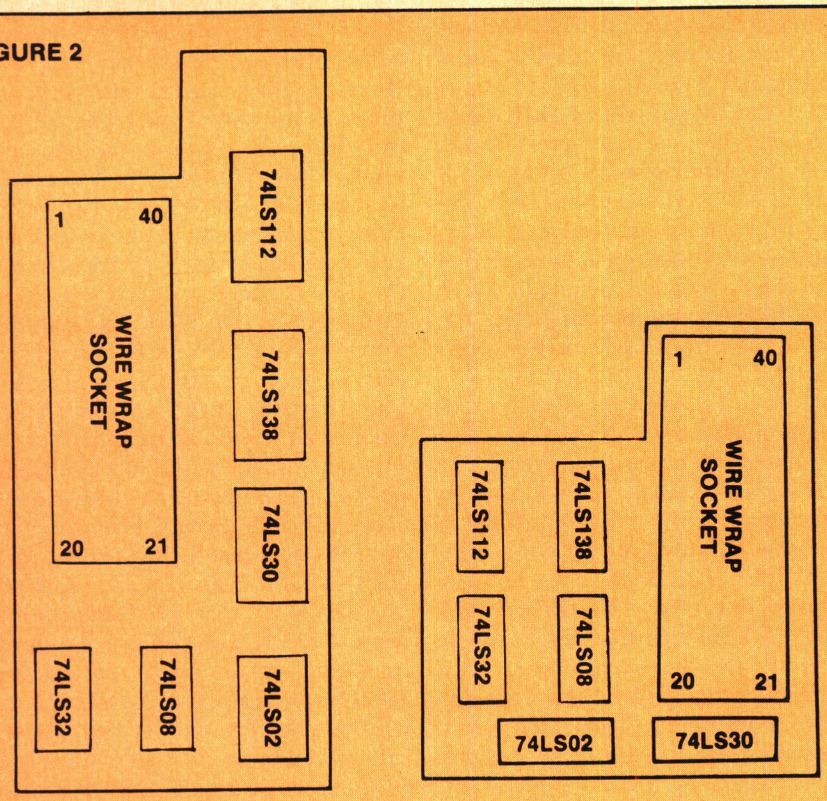
Now a little background on this 128K modification. The main objectives are basically common sense. The modification must be usable by BASIC, and relatively inexpensive to upgrade the current CoCo. It also has to like FLEX, and OS-9. For these objectives to be reached we chose to use two sets of 64K chips. There are six other chips involved in the modification, which take care of selecting the banks. Actually five of the chips take care of the bank selection, but due to timing considerations, the sixth chip makes certain that the computer operates with RAM chips of all speeds. The method was limited to bank selection since the CPU can only address 64K at any one given time. We chose to exchange the lower banks of 32K, address between zero and 32767 (0000-7FFF). Now with three lower banks of RAM, BASIC can have three programs resident in memory. Also there is another 32K bank of RAM, addresses 32768 to 65535 (8000-FFFF), where a control program can be placed to operate the lower three banks, similar to 128K operation of an Apple II. Realistically speaking, with ROM included, there is a total of 160K available. Refer to Figure 1 for a block diagram of how the 32K pages are configured.

Figure 1


FFFF
FFFF
ROM BANK
NORMAL
POWER UP PAGE
SELECTED BY
POKING FFDE
BANK 0
PAGE 1
SELECTED BY
POKING FFDF
8000
7FFF
8000
7FFF
BANK 0
PAGE 0
NORMAL
POWER UP PAGE
SELECTED BY
POKING FFAE
BANK 1
PAGE 0
SELECTED BY
POKING FFAC
BANK 1
PAGE 1
SELECTED BY
POKING FFAD
0000
0000
SELECTED BY
POKING FFAF

(Dennis Lewandowski, one of the early authors active with the Color Computer, specializes in machine language programming. He and his wife, Rose, founded DSL Computer Products.)

FIGURE 2


1
40
WIRE WRAP SOCKET
20
21
74LS112
74LS138
74LS30
74LS32
74LS08
74LS02
1
40
WIRE WRAP SOCKET
20
21
74LS112
74LS138
74LS32
74LS08
74LS02
74LS30

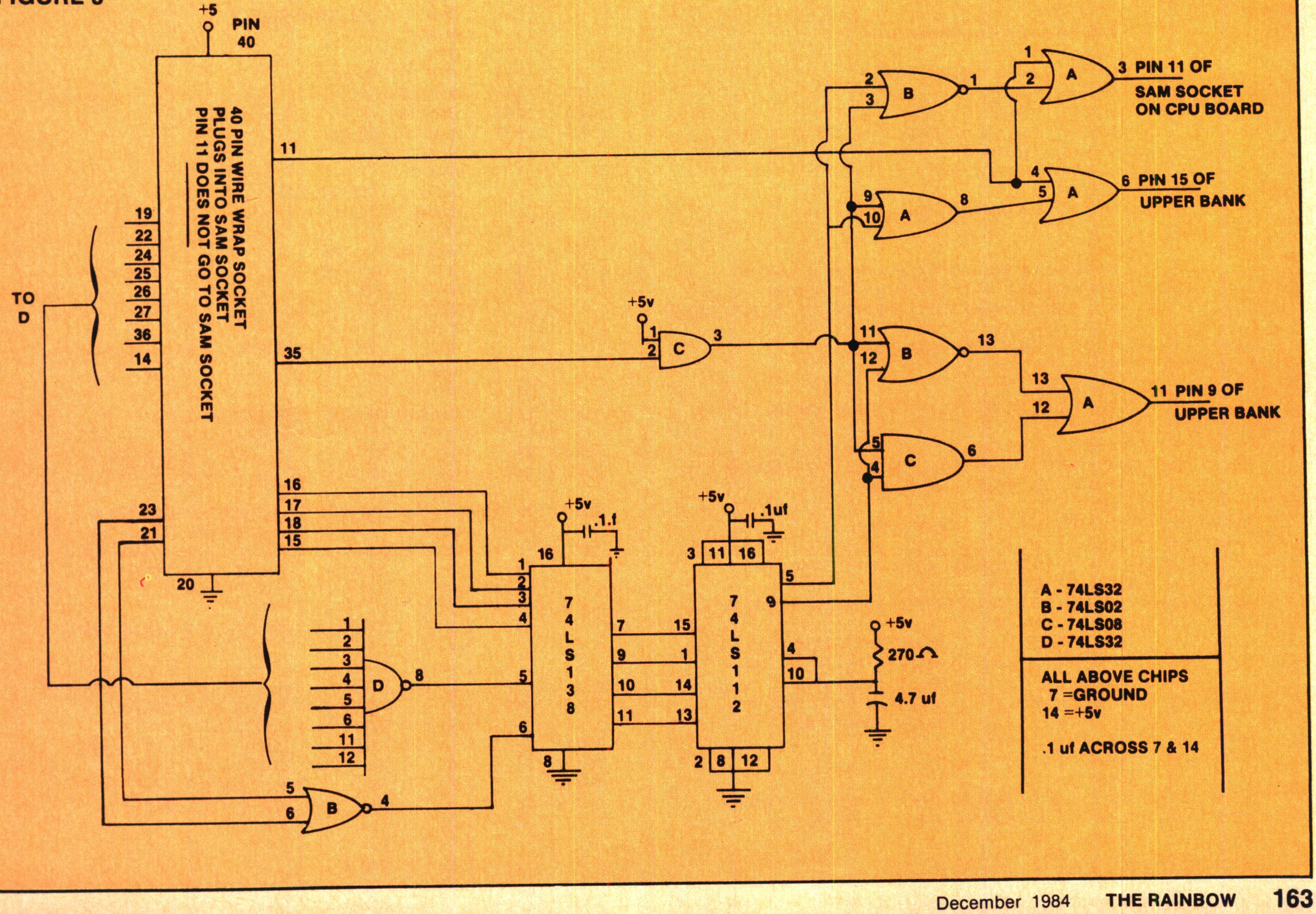
F BOARD LAYOUT

D, E, COCO 2 LAYOUT

How To Do It

The simplest way of inserting memory, since there are only eight RAM sockets, is to piggyback the chips. There are data lines running through the 74LS244 (U19), that exist only at that chip. To place the additional RAM anywhere else would require the removal of the 74LS244 and installing a series of jumpers from its position. The drawback of this is since late version "E" boards, the 74LS244 has been soldered onto the board. Also the more wire that runs around inside the computer, the more noise (RF) the computer will generate. By piggybacking the 64K chips, these problems disappear. Most of the signals required to operate more memory will come from the SAM chip; to do this the SAM is elevated by means of a wire wrap socket. The additional chips are then placed on a board attached to that socket. Depending on your own level of soldering ability, there are a couple of ways to proceed. Using the suggested board layout (Figure 2), cut a sheet of perf board to dimension. Then follow the wiring diagram (Figure 3), and hand wire the board. The parts necessary to make 64K CoCo into a 128K CoCo are as follows:

FIGURE 3


+5
PIN 40
40 PIN WIRE WRAP SOCKET
PLUGS INTO SAM SOCKET
PIN 11 DOES NOT GO TO SAM SOCKET
11
19
22
24
25
26
27
36
14
TO D
35
16
17
18
15
23
21
20
+5v
C
3
B
A
3 PIN 11 OF SAM SOCKET ON CPU BOARD
6 PIN 15 OF UPPER BANK
11 PIN 9 OF UPPER BANK
13
12
6
+5v
.1 f
16
74LS138
+5v
.1uf
3 11 16
74LS112
5
9
4
10
+5v
270Ω
4.7 uf
2 8 12
D
8
B
4
A - 74LS32
B - 74LS02
C - 74LS08
D - 74LS32
ALL ABOVE CHIPS
7 = GROUND
14 = +5v
.1 uf ACROSS 7 & 14

8 - 64K RAM Chips (4164 or equiv.)
1 - 74LS02 Quad NOR gate
1 - 74LS08 Quad AND gate
1 - 74LS30 8 Input gate
1 - 74LS32 Quad OR gate
1 - 74LS112 Dual JK Flip Flop
1 - 74LS138 3 to 8 Line Decoder
1 - 270 ohm Resistor
1 - 4.7 uf Capacitor
6 - .1 uf Capacitors
1 - Spool of Wire (R/S # 278-501)

One important item is that pin 11 of the SAM chip does not go through to the original socket as all the other pins do. It should be cut off right below its connection to pin 4 of the 74LS32.

If you prefer the board with the six chips soldered and tested, it is available from DSL Computer Products for $34.95. If you want to just plug in and go, the complete mod including an additional 64K of RAM is $99. The installation of the complete mod is solderless.

How To Use It

Once the 128K modification is done, what can you do with it? When you power up the computer everything should be the same as normal including the familiar answer to the *?MEM* question. So how do you have 128K? Type in the command *POKE &HFFAE,0* and press ENTER. Now if you see garbage on the screen this is normal, press Reset, and the computer powers up again. If you don't have a disk system the computer will reset automatically, usually. You are now in bank zero, page zero of RAM. This is the normal bank in which a 64K Color Computer will power up. To enter the upper bank of 64K type *POKE&HFFAC,0:POKE&HFFAF,0.* Again, if you see garbage just press Reset. You are now in bank one, page zero. (One way to be sure you are switching banks is that the screen will change with the bank. If the poke has no effect you may have a wiring problem.) Finally, type *POKE&HFFAD,0.* This is bank one, page one. Now all three lower pages of 128K mod have been initialized.

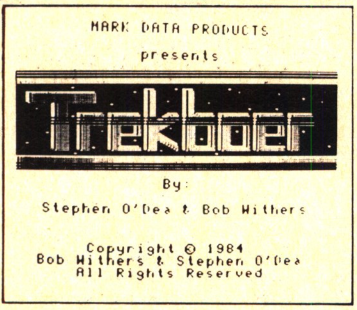
Referring to Figure 1 again, the normal memory map has not been changed, but rather modified. Two 32K pages have been added along side the present 32K page used by BASIC. All current software will run as it normally does. The only way a different bank can be accessed is by poking (writing) to a memory location between 65452 and 65455. The value poked into that address can be zero to 255. By switching banks, three programs can reside in the computer at the same time. The CPU can only run one program at a time, unless another operating system is controlling it, such as FLEX or OS-9. However, all three programs can be run in such a way that it will seem that they are running all the time. There is one consideration using BASIC; that is the location of the Stack Pointer. If one of the programs clears space for strings or arrays, the Stack Pointer would be adjusted. Then when that bank is switched out the Stack Pointer would be pointing to nowhere. The results could cause the computer to lock up. For this reason there is a program listing included called *STAKSTAT.* This will initalize all three lower banks, transfer ROM to the upper bank of RAM, and add a new command to BASIC. By entering the command *PAGE x,* where x is 0, 1, or 2, that page will be selected and the correct stack value will be placed into the Stack Pointer. Please note that *STAKSTAT* can be used freely with any 128K software that you develop. However, if you wish to send it to a magazine to have it published, remember where you saw it first!

Listing 1:

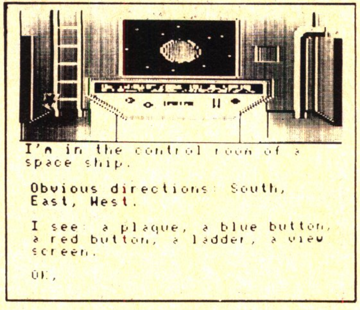
```
                 00100 ********************************
                 00110 **                             **
                 00120 **     PAGER VERSION 9.10.84   **
                 00130 **                             **
                 00140 **     COPYRIGHT (c) 1984      **
                 00150 **     DSL COMPUTER PRODUCTS   **
                 00160 **     WRITTEN BY              **
                 00170 **     GERALD S. EGGART        **
                 00180 **                             **
                 00190 ********************************
                 00200
                 00210 *
                 00220 *THIS PROGRAM IS FOR USE WITH THE DSL 128K UPGRADE
                 00230 *UPON ENTRY (EXEC) ALL REGISTERS ARE MODIFIED
                 00240 *UPON CALL (PAGE) STACK IS PRESERVED & ALL REGISTERS MODIFIED
                 00250 *
7000             00260        ORG   $7000   LOAD ADDRESS
                 00270
                 00280 *
                 00290 *INITIALIZE ZERO PAGE ROUTINE FOR NEW COMMAND
                 00300 *
                 00310
7000 CE   013E   00320 INIT1 LDU #$13E     THE ADDRESS WERE THE INTERPRETER
                 00330 *                   VECTOR TABLE IS
                 00340
7003 86   01     00350 HRE   LDA #1       ONE NEW COMMAND
7005 A7   C0     00360       STA ,U+
7007 30   8D 0024 00370      LEAX TABLE,PCR  ADDRESS OF NEW COMMAND TABLE
700B AF   C1     00380       STX ,U++
700D 30   8D 0023 00390      LEAX SUBRO,PCR NEW COMMAND HANDLING ROUTINE ADRS
7011 AF   C1     00400       STX  ,U++
7013 6F   C4     00410       CLR ,U         NO SECONDARY FUNCTIONS ADDED
7015 8E   B277   00420       LDX #$B277     SECONDARY FUNCTION HANDLEING
                 00430 *                    ROUTINE (?SN ERROR)
7018 AF   43     00440       STX 3,U        CLEAROUT NEXT TABLE ENTRY...
                 00450 *                    NO MORE COMMANDS ADDED
701A 6F   45     00460       CLR 5,U
701C AF   42     00470       STX 2,U
                 00480
701E 30   8D 0022 00490      LEAX ENTRY,PCR ADDRESS OF ROUTINE TO DO PAGEING
7022 AF   8D 0001 00500      STX ADDRE,PCR  STORE IT IN THE JUMP TABLE
7026 39          00510       RTS
                 00520
                 00530 *
                 00540 *     NEW COMMAND TABLE
                 00550 *
                 00560
7027      0000   00570 ADDRE FDB 00
7029      0000   00580 ADD1  FDB 00
702B      0000   00590 ADD2  FDB 00
702D      0000   00600 ADD3  FDB 00
                 00610
                 00620 *
                 00630 *     NEW WORD TABLE
                 00640 *
                 00650
702F      50     00660 TABLE FCC /PAG/
7032      C5     00670       FCB 'E+$80
7033      00     00680       FCB 0
                 00690
                 00700 *
                 00710 *     NEW   INTERPRETER ROUTINE FOR THE ADDED WORD(S)
                 00720 *
                 00730
7034 81   E4     00740 SUBRO CMPA #$E4  HIGEST TOKEN VALUE USED
                 00750 *                (#$E5 FOR DISK 1.1)
7036 25   03     00760       BLO LO     IF ITS LOWER ITS A VALID TOKEN
7038 7E   B277   00770       JMP $B277  NOT A VALID TOKEN SO ?SN ERROR
                 00780
703B 30   8D FFE8 00790 LO   LEAX ADDRE,PCR  GET ADDRES OF WERE TO GO TO
                 00800 *                     EXEC COMMAND
703F 80   E1     00810 SUBR1 SUBA #$E1       SET OFFSET BYTE TO WHICH COMMAND
7041 7E   ADD4   00820       JMP $ADD4       GO LET ROM EXEC COMMAND (ENTRY)
                 00830
                 00840 *
                 00850 *     THIS IS THE TRUE EXECUTION OF THE PAGE COMMAND
                 00860 *
                 00870
7044             00880 ENTRY
7044 BD   B70B   00890       JSR   $B70B   EVALUATE AN EXPRESSION
                 00900 *               >0 /<256 AND RETURN IT IN B
7047 C1   02     00910       CMPB  #2      IS THE PAGE VALUE GREATER THAN 2
7049 22   29     00920       BHI   ERROR   IF IT IS THEN 'FC ERROR'
704B 5D          00930       TSTB          IS IT PAGE 0?
704C 26   07     00940       BNE   CONTST  NOPE THEN GOTO CONTST
                 00950
                 00960 *
                 00970 *     PAGE 0
```

NEW! Trekboer

HI-RES
ADVENTURES
DISC NOT REQUIRED
Cassettes — $24.95/Discs — $27.95



```
MARK DATA PRODUCTS
presents
Trekboer
By:
Stephen O'Dea & Bob Withers

Copyright © 1984
Bob Withers & Stephen O'Dea
All Rights Reserved
```

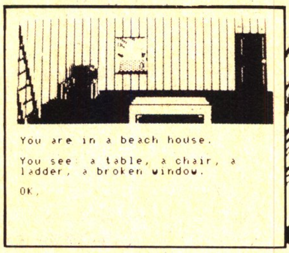


```
I'm in the control room of a
space ship.

Obvious directions: South,
East, West.

I see: a plaque, a blue button,
a red button, a ladder, a view
screen.

OK.
```

SCI-FI FANS, here it is! A new hi-res adventure even more challenging than any of our others.

This exciting hi-res adventure begins aboard the starship TREKBOER in the 21st century. Life on Earth is threatened by a deadly virus and your mission is to search the frontiers of space and return with a cure to save mankind from disaster. But how? Where? The name of your starship provides the first clue...

Press Release *"Trekboer is the latest in the collection of fine adventure games from Mark Data Products. Sure to be a hit!"*

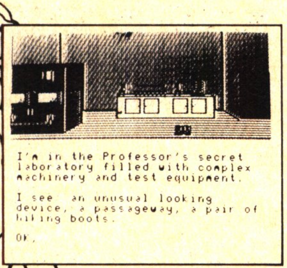


```
You are in a beach house.

You see: a table, a chair, a
ladder, a broken window.

OK.
```

SEA SEARCH

Get your shark repellant and scuba tanks ready! The graphics in this adventure are truly outstanding and the underwater scenes are unforgettable. You'll run into a pirate, a mermaid and some hungry sharks in this colorful and unique treasure hunt. 32K required.

Hot CoCo—April '84 "The fine graphics accent your imagination."

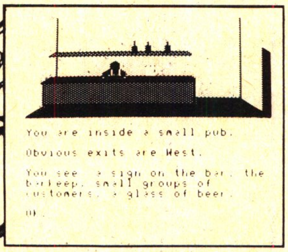


```
I'm in the Professor's secret
laboratory filled with complex
machinery and test equipment.

I see: an unusual looking
device, a passageway, a pair of
hiking boots.

OK.
```

CALIXTO ISLAND

A valuable museum treasure has been stolen, can you recover it??? This is a challenging puzzle with an occasional twist of humor. You'll visit a secret laboratory, a Mayan pyramid and you'll meet crazy Trader Jack—all in living color and exciting detail. You will really love this hi-res graphic version of the classic Calixto Island Adventure. 32K required.

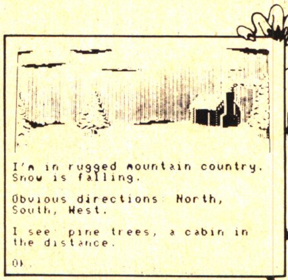
Rainbow—April '84 "It was enough to keep my wife and 8 year old son glued to the computer for an entire weekend and two week nights."



```
You are inside a small pub.

Obvious exits are West.

You see: a sign on the bar, the
barkeep, small groups of
customers, a glass of beer.

OK.
```

SHENANIGANS

Countless legends tell of a magnificent Pot of Gold hidden at the end of the rainbow. Many have attempted to find the marvelous treasure but success has eluded them and it remains hidden to this day. You, as a dedicated adventurer, have determined to search for the fabled riches and succeed where others have failed. This one is great fun! 32K required.



```
I'm in rugged mountain country.
Snow is falling.

Obvious directions: North,
South, West.

I see: pine trees, a cabin in
the distance.

OK.
```

BLACK SANCTUM

Encounter the forces of black magic as you roam around an old 18th century monastery. You'll see all the evil locations in this spooky adventure; you'll love searching out and destroying the evil in this classic tale. A MUST for every adventure game fan! 32K required.

Rainbow—May '84 "It's the graphic screens that are the shining stars...Some of the best I've seen."

FREE — Send for our NEW 24 page Catalog!

MD
Mark Data Products
24001 ALICIA PKWY., NO. 207 • MISSION VIEJO, CA 92691 • (714) 768-1551

SHIPPING: All orders under $100 please add $2 regular, $5 air. All orders over $100 please add 2% regular, 5% air. California residents please add 6% sales tax. Orders outside the continental U.S., check with us for shipping amount; please remit U.S. funds. Software authors—contact us for exciting program marketing details. We accept MasterCard and VISA. Distributed in Canada by Kelly Software.

```
                    00980 *
704E AE    E4       00990        LDX   ,S     GET RTS ADDRESS OFF THE STACK
7050 7F    FFAE     01000        CLR   $FFAE  FLIP TO PAGE ZERO
7053 20    16       01010        BRA   ENDIT  AND EXIT
                    01020
                    01030 *
                    01040 *      PAGE 1 AND PAGE 2 TEST
                    01050 *
7055 C1    01       01060 CONTST CMPB  #1     IS IT PAGE ONE?
7057 26    0A       01070        BNE   PG2    NO GOTO PG2
                    01080 *
                    01090 *      PAGE 1
                    01100 *
                    01110
7059 AE    E4       01120        LDX   ,S   GET RETURN ADDRESS
705B 7F    FFAC     01130        CLR   $FFAC GO TO PAGE 1
705E 7F    FFAF     01140        CLR   $FFAF
7061 20    08       01150        BRA   ENDIT AND EXIT
                    01160 *
                    01170 *      PAGE 2
                    01180 *
                    01190
7063 AE    E4       01200 PG2    LDX   ,S   GET RETURN ADDRESS OFF STACK
7065 7F    FFAD     01210        CLR   $FFAD GOTO PAGE 2
7068 7F    FFAF     01220        CLR   $FFAF
                    01230
706B 10BE 00F3      01240 ENDIT  LDY   >$F3  GET THE LOC OF THIS PAGES STACK
706F 1F    24       01250        TFR   Y,S   PUT STACK BACK
7071 AF    E4       01260        STX   ,S    SAVE RETURN ADDRESS BACK ON STACK
7073 39             01270        RTS
                    01280 *
                    01290 *      ERROR HANDLER IF PARAMETER IS BAD IN PAGE COMMAND
                    01300 *
                    01310
7074                01320 ERROR
7074 7E    B706     01330        JMP   $B706  GOTO 'FC ERROR'
                    01340
                    01350 *
                    01360 *      THE FOLLOWING CODE IS USED ONCE TO
                    01370 *      SET UP THE COMPUTER UPON EXEC
                    01380 * THIS CODES MOVES ROM TO RAM
                    01390 *             RELOCATES THE MAIN PRGORAM
                    01400 *             AND INITAILIZES ALL THREE BANKS
                    01410 *             TO A POWER UP STATUS
                    01420 *
                    01430
7077 B6    0134     01440 START  LDA   $134
707A 81    00       01450        CMPA  #$0
707C 26    06       01460        BNE   STCONT
707E CE    0134     01470        LDU   #$134
7081 FF    7001     01480        STU   INIT1+1
                    01490
7084 81    14       01500 STCONT CMPA  #20
7086 26    0A       01510        BNE   HERE
7088 86    E5       01520        LDA   #$E5
708A B7    7035     01530        STA   SUBRO+1
708D 86    E2       01540        LDA   #$E2
708F B7    7040     01550        STA   SUBR1+1
7092 1A    50       01560 HERE   ORCC  #$50     DISABLE INTERUPTS
7094 CE    8000     01570        LDU   #$8000   START OF ROM
7097 8E    FFDE     01580        LDX   #$FFDE   ROM ON LOCATION
709A 108E FFDF      01590        LDY   #$FFDF   ROM OFF LOCATION
                    01600 *
                    01610 *      COPY ROM TO RAM
                    01620 *
709E EC    C4       01630 LOOP   LDD   ,U      GET TWO BYTES OF ROM
70A0 6F    A4       01640        CLR   ,Y      GOTO ALL RAM MODE
70A2 ED    C1       01650        STD   ,U++    SAVE THE BYTES IN RAM
70A4 6F    84       01660        CLR   ,X      BACK TO ROM/RAM MODE
70A6 1183 FE00      01670        CMPU  #$FE00  AT THE END OF ROM?????
70AA 22    02       01680        BHI   EXIT    YEP... GOTO EXIT
70AC 20    F0       01690        BRA   LOOP    GO DO SOME MORE
                    01700
70AE CE    F000     01710 EXIT   LDU   #$F000    DONE MOVING ROM TO RAM SO NOW
                    01720 *                    LETS MOVE THE PROGRAM ABOVE ROM
70B1 30    8D FF4B  01730        LEAX  INIT1,PCR START OF PROGRAM
70B5 108E F000      01740        LDY   #$F000    DESTINATION ADDRESS
70B9 7F    FFDF     01750        CLR   $FFDF     GOTO ALL RAM MODE
                    01760
70BC EC    81       01770 MLOOP  LDD   ,X++      GRAB 2 BYTES OF PROGRAM
70BE ED    A1       01780        STD   ,Y++      SEND IT ABOVE ROM
70C0 8C    7141     01790        CMPX  #DUMY     END OF PROGRAM???
70C3 25    F7       01800        BLO   MLOOP     NO THEN GO GET SOME MORE
                    01810
                    01820 *
                    01830 *      NOW GO TO THE ROUTINE INTPGE TO INITILAIZE MEMORY.
                    01840 *      FIGURE OFFSET
                    01850 *
                    01860
70C5 30    8D 000B  01870        LEAX  INTPGE,PCR  ADDRESS OF WEAR THE
                    01880 *                        ROUTINE NOW IS
70C9 1E    10       01890        TFR   X,D
70CB 83    7000     01900        SUBD  #INIT1      SUBTRACT THE START OF THE PROGRAM
70CE C3    F000     01910        ADDD  #$F000      ADD OFFSET
70D1 34    06       01920        PSHS  D           FAKE RETURN ADDRESS
70D3 39             01930        RTS               GOTO INTPGE ROUTINE THAT HAS
                    01940 *                        BEEN TRANSFERED INTO UPPER MEMORY
                    01950 *
                    01960 *      THIS ROUTINE INITAILIZES ALL LOWER 32K PAGES
                    01970 *
                    01980
70D4 108E FFAC      01990 INTPGE LDY   #$FFAC  PAGE SELECT ADDRESS
70D8 86    F2       02000        LDA   #$F2
70DA B7    00F3     02010        STA   >$F3
70DD 7F    FFAE     02020        CLR   $FFAE
70E0 B1    00F3     02030        CMPA  >$F3
70E3 27    13       02040        BEQ   CNTINT
70E5 CE    0000     02050        LDU   #$0
70E8 7F    FFAF     02060 INITLP CLR   $FFAF
70EB EC    C4       02070        LDD   ,U
70ED 7F    FFAE     02080        CLR   $FFAE
70F0 ED    C1       02090        STD   ,U++
70F2 1183 7FFF      02100        CMPU  #$7FFF
70F6 25    F0       02110        BLO   INITLP
                    02120
70F8 CE    0000     02130 CNTINT LDU   #$0     START COPY AT ZERO
70FB 8D    29       02140        BSR   COPY    GO COPY A PAGE
70FD 108C FFAD      02150        CMPY  #$FFAD  ARE WE AT THE LAST 32K PAGE?
7101 27    04       02160        BEQ   OUT     YEP.... TIME TO GO!
7103 31    21       02170        LEAY 1,Y      NO SO POINT Y TO NEXT MAGIC MEMORY LOCATION
7105 20    F1       02180        BRA   CNTINT  GO DO IT ALL AGAIN
                    02190
7107 7F    FFAF     02200 OUT    CLR   $FFAF   NOW TO COPY THE STACK ADDRESS
                    02210 *                    TO ALL PAGES
710A 7F    FFAC     02220        CLR   $FFAC
710D 1F    41       02230        TFR   S,X     GRAB THE STACK ADDRESS
710F BF    00F3     02240        STX   >$F3    SAVE IT IN PAGE 1
7112 7F    FFAD     02250        CLR   $FFAD
7115 BF    00F3     02260        STX   >$F3    ALSO PAGE 2
7118 7F    FFAE     02270        CLR   $FFAE
711B BF    00F3     02280        STX   >$F3    AND PAGE 3
711E 1C    AF       02290        ANDCC #$AF    RENABLE ITTERUPTS
```

"Good Memory Database"

(FROM 9/84 RAINBOW REVIEW). CALL FOR FREE REPRINT!

DISK & PRINTER ARE OPTIONAL IN THE SUPER-FRIENDLY DO-FILE SYSTEM: NEEDS ONLY TAPE, 32K & EXT. BASIC. ALL WORK DONE IN MEMORY. NO PROGRAMMING REQUIRED TO BUILD HOUSEHOLD INVENTORY, WINE LIST, ANY LIST. YOU DESIGN YOUR OWN RECORDS. AND - YOU DON'T HAVE TO GET IT RIGHT THE FIRST TIME. EXPAND ANY FIELD, ADD NEW FIELDS - WITHOUT LOSING ANY EXISTING DATA. CREATE, REMOVE AND CHANGE RECORDS - SEARCH, SORT, LIST AND TOTAL THEM - LOAD AND SAVE FILES USING CASSETTE OR DISK (OR BOTH). DISPLAY YOUR RECORDS ON THE SCREEN AND/OR PRINTER IN ORIGINAL OR SORTED SEQUENCE (OR BOTH). SELECT AND SORT (ASCENDING OR DESCENDING) RECORDS ON UP TO 3 FIELDS. YOUR FILES CAN BE AS BIG AS 16,500 CHARACTERS. DO-FILE HAS EASY, ONE-KEY COMMANDS AND A HELP MENU, TOO. IT IS EVEN DESIGNED TO PROTECT YOU FROM MAKING MISTAKES! DO-FILE IS EDUCATIONAL - YOU LEARN FILE MANAGEMENT USING A 35-PAGE TUTORIAL GUIDE & SAMPLE DATA FILE!

CALL FREE! 1-800-334-0854, EXT. 856, TO ORDER, OR, SEND $29.95 (CHECK OR MONEY ORDER) PLUS $2.00 FOR POSTAGE/HANDLING (PA RESIDENTS ADD $1.92 TAX), TO:

SOLID
SOFTWARE

MasterCard
VISA

RAINBOW
CERTIFICATION
SEAL

P.O. Box 712• Levittown, PA 19058

DATAMAN
INTERNATIONAL

VISA 1-416-529-1319 MC

DEALERS

YOU CAN RECEIVE A 30 MINUTE IN STORE DEMO DISK THAT IS GUARANTEED TO

**** *BLOW YOU AWAY* ****

THE GRAPHIC/TEXT MASTER DEMO DISK CONTAINS BOTH M/L PROGRAMS PLUS A BASIC DEMONSTATION OF THE INCREDIBLE VERSITILITY OF THESE NEW "STATE OF THE ART" UTILITIES.

SEND YOUR REQUESTS ON COMPANY LETTERHEAD ALONG WITH $20.
WE WILL SEND YOU THE DEMO PACKAGE AND A CREDIT FOR $20
WHICH YOU CAN APPLY TO YOUR NEXT ORDER.

DATAMAN
INTERNATIONAL
125 SOUTH FIFTH STREET
LEWISTON, N.Y. 14092

DATAMAN
INTERNATIONAL
420 FERGUSON AVE. N.
HAMILTON,ONT.,L8L 4Y9

```
7120 7F   FFAE     02300        CLR   $FFAE
7123 7E   F000     02310        JMP   $F000   GO INITAILIZE THE NEW WORD TABLE
                   02320 *                    IN PAGE 0 AND RETURN TO BASIC
                   02330 *
                   02340 *      THIS ROUTINE COPIES ONE 32K PAGE TO ANOTHER
                   02350 *
7126 7F   FFAE     02360 COPY   CLR   $FFAE     GOTO PAGE ZERO
7129 EC   C4       02370        LDD   ,U        YANK A COUPLE OF BYTES
712B 7F   FFAF     02380        CLR   $FFAF     SELECT OTHER 64K BANK
712E 6F   A4       02390        CLR   ,Y        SELECT WHICH 32K PAGE
7130 ED   C1       02400        STD   ,U++      SAVE THE BYTES
7132 1183 7FFF     02410        CMPU  #$7FFF    END OF 32K PAGE???
7136 25   EE       02420        BLO   COPY      NO THEN DO SOME MORE!
7138 17   FEC5     02430        LBSR  INIT1     YEP SO INITAILIZE THE NEW COMMAND
                   02440 *                      TABLE IN THIS PAGE
713B 7F   FFAE     02450        CLR   $FFAE     BACK TO PAGE ZERO FOR THE RTS
713E 39            02460        RTS
                   02470
                   02480 *
                   02490 *      DUMY LABEL SO I KNOW WHERE THIS PRGRAM ENDS!!!
713F      0000     02500 STACK  FDB   00
7141      0000     02510 DUMY   FDB   00
          7077     02520        END   START
00000 TOTAL ERRORS
```

22 34
END 55

Listing 2:

```
0 '****************************
1 '**                        **
2 '** PAGER VERSION 9.10.84  **
3 '**                        **
4 '**     COPYRIGHT 1984     **
5 '** DSL COMPUTER PRODUCTS  **
6 '**                        **
7 '****************************
8 CLEAR200,&H7000
9 FORI = 28672 TO 28976
10 READ A
11 POKE I,A
12 NEXT I
13 EXEC 28767
14 CLEAR200 ,&H7FFF
15 NEW
16 DATA 191,224,0,16,191,224,2,2
55,224,4,253,224,6,189,183,11,19
3,2,34,59
17 DATA 31,65,191,0,243,93,38,7,
174,228,127,255,174,32,22,193,1,
38,10,174
18 DATA 228,127,255,172,127,255,
175,32,8,174,228,127,255,173,127
,255,175,16,190,0
19 DATA 243,31,36,175,228,190,22
4,0,16,190,224,2,254,224,4,252,2
24,6,57,190
20 DATA 224,0,16,190,224,2,254,2
24,4,252,224,6,126,183,6,23,0,36
,127,255
21 DATA 223,48,141,0,23,16,142,1
70,241,141,8,142,240,0,191,171,1
73,32,44,166
22 DATA 128,39,4,167,160,32,248,
57,80,65,71,69,160,0,26,80,206,1
28,0,142
23 DATA 255,222,16,142,255,223,2
36,196,111,164,237,193,111,132,1
7,131,254,0,34,2
24 DATA 32,240,57,206,240,0,48,1
41,255,86,16,142,240,0,127,255,2
23,236,129,237
25 DATA 161,140,113,47,37,247,48
,141,0,11,31,16,131,112,0,195,24
0,0,52,6
26 DATA 57,16,142,255,172,134,24
2,183,0,243,127,255,174,177,0,24
3,39,19,206,0
27 DATA 0,127,255,175,236,196,12
7,255,174,237,193,17,131,127,255
,37,240,206,0,0
28 DATA 141,39,16,140,255,173,39
,4,49,33,32,241,127,255,175,127,
255,172,31,65
29 DATA 191,0,243,127,255,173,19
1,0,243,127,255,174,191,0,243,28
,175,127,255,174
30 DATA 57,127,255,174,236,196,1
27,255,175,111,164,237,193,17,13
1,127,255,37,238,127
31 DATA 255,174,57,0,0
```

SuperSpooler

Free your fast computer from your slow printer!

SuperSpooler allows your computer to work on one task while your printer works on another.

- works with any size memory (64K recommended)
- compatible with Telewriter, Ultra 80CC etc., and all BASIC programs
- small—64K version uses only 80 bytes of user RAM
- written in relocatable machine language
- 32K buffer with a 64K system
- selectable buffer size and location
- reprint buffer as many times as you want, when you want
- clear buffer at any time
- check status of buffer
- adjust speed of output to suit your printer and interface
- most features enabled with one keystroke at any time, even during application program execution

$19.95 U.S. or **$24.95** Canadian

Also Available:
SBASIC 1.0—a structured BASIC pre-compiler.

$19.95 U.S. or **$24.95** Canadian

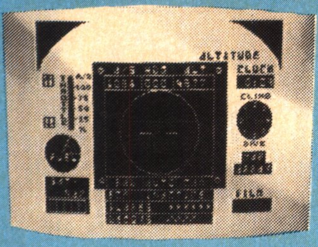
Ordering Information:
Please specify cassette or disk. To order send check or money order, or use VISA or MasterCard. If using VISA or MasterCard, include card number and expiration date.
For UPS delivery add $1 in Ontario and Montreal
$3 in the U.S.
Ontario residents add 7% sales tax.
To order or for more information please write,

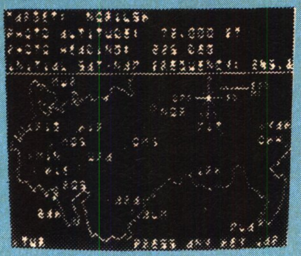
RAINBOW CERTIFICATION SEAL

Tandar Software

12 Araman Drive Agincourt, Ontario Canada M1T 2P6 (416) 293-2014

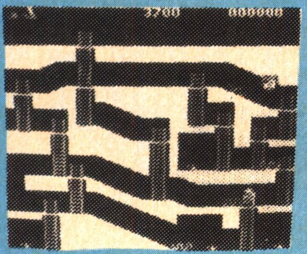
DEALER INQUIRIES WANTED





SR-71

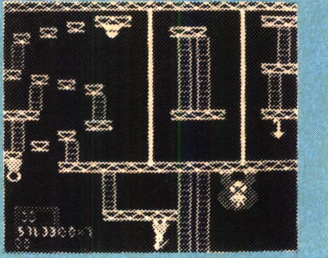
SR-71 is a fast action game in which you are the pilot on a mission to take photographs of missile sites in Russia and deliver them to our processing laboratory in Japan. So real you will feel as if you are in the cockpit on a real spy mission. Elude Russian missiles as well as their detection devices. Another Tom Mix exclusive. A must for the adventurous. Fantastic graphics, color and sound. **32K Ext. Basic** **TAPE $28.95** **DISK $31.95**

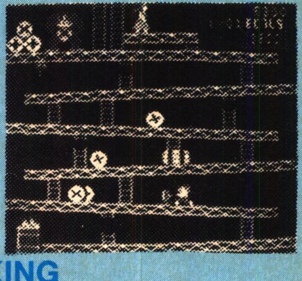


KING TUT

Journey through the caverns of King Tut's tomb. You are on a quest to find treasurers hidden in the caverns below. You light your way with only a small candle that grows dimmer as time passes. Watch out for the snakes and the ghost of King Tut himself. Five screens challenge your abilities every step of the way. Joysticks required.

16K MACHINE LANGUAGE
TAPE $27.95 **DISK $30.95**

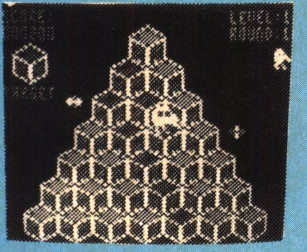




THE KING

This game contains all 4 full graphic screens like the popular arcade game. Exciting sound and realistic graphics. Never before has the color computer seen a game like this. Early reviews say simply outstanding. **JOYSTICKS REQUIRED**

32K MACHINE LANGUAGE
TAPE $26.95 **DISK $29.95**



CU ✱BER

Approaches the excitement and challenges of any Video Arcade. The hazards of CU ✱BER are many. Help CU ✱BER change the colors on the pyramid while avoiding many of the dangers always present. Vipers, the Nurd, the Dork, bonus points all add up to another exciting release from Tom Mix Software.

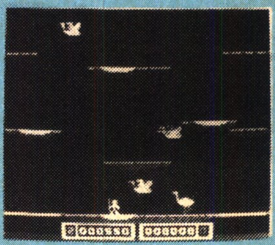
32K MACHINE LANGUAGE TAPE
$27.95 **DISK $30.95**

BUZZARD BAIT

We've done it again. You thought The King was great? Wait till you see this! Outstanding high resolution graphics, tremendous sound make this "joust" type game a must for your software collection. As you fly from cloud to cloud you will enjoy sky high excitement dealing with the challenges presented to you by this newest release by Tom Mix Software.

Joysticks required.

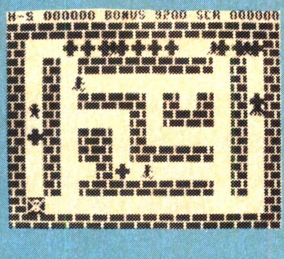
32K MACHINE LANGUAGE
TAPE $27.95 **DISK $30.95**



FANGMAN

Fangman is a high-resolution graphics arcade-type game based on the Dracula legend. Plot of Game: You're Dracula in your castle, stalking through a labrynth of passages in search of invading villagers seeking to destroy you by blocking your every path with deadly crosses. Their ally the Sun also wanders your halls, trying to touch you and turn you to bones and dust. Fortunately, you have allies of your own, your vampire bats who chase down the villagers, holding them till you arrive. Joysticks required.

16K MACHINE LANGUAGE
TAPE $24.95 **DISK $27.95**



HERE IS A GREAT UTILITY PROGRAM

SCREEN PRINT ROUTINE Prints contents of your graphic screen to an Epson, Microline or Radio Shack DMP Printers. Prints positive or reverse format. Horizontal or vertical, small and large printout. Print left, right, or center of page. Specify printer when ordering.
TAPE $19.95 **DISK $21.95**

TAPE TO DISK New version works both 1.0 and 1.1 DOS. Load the contents of most tapes to disk automatically.
16K MACHINE LANGUAGE **TAPE $17.95** **DISK $21.95**

Tom Mix Software Now Offers The Complete VIP Library System

VIP Writer™
RATED TOPS IN RAINBOW, HOT COCO, COLOR COMPUTER MAGAZINE & COLOR COMPUTER WEEKLY.
32K (Comes with tape & disk) $69.95
(Includes VIP Speller)

VIP Speller™
WITH A 60,000 WORD INDEXED DICTIONARY! It can be used to correct any ASCII file — including **VIP Library™** files and files from **Scripsit™** and **Telewriter™.**
32K DISK ONLY $49.95

VIP Calc™
You can forget the other toy calcs — The real thing is here! No other spreadsheet for the Color Computer gives you so many features.
32K (Comes with tape & disk) $69.95
32K does have hi-res displays, sort or edit.

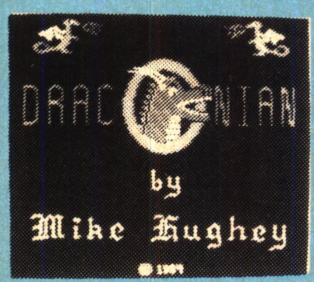
VIP Terminal™
RATED BEST IN JANUARY 1984 "RAINBOW" Choce of 8 hi-res lowercase displays * Memory-Sense with BANK SWITCHING for full use of workspace.
32 K (Comes with tape & disk) $49.95
(Tape comes in 16K but without hi-res displays)

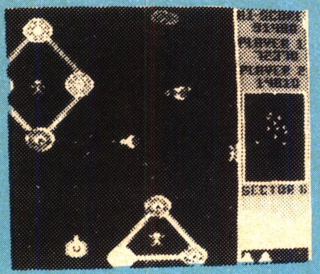
VIP Database™
INCLUDES MAIL MERGE CAPABILITIES TOO! 32K DISK $59.95 64K Required for math package & mail merge.

VIP Disk-Zap™
Repairs crashed disks.
16K DISK $49.95 Lowercase displays not available with this program.

TOM MIX SOFTWARE
4285 BRADFORD N.E.
GRAND RAPIDS, MI 49506

• ADD $2.50 POSTAGE & HANDLING • (CANADA ADD $3.00) •
• MICHIGAN RESIDENTS ADD 4% SALES TAX •
LOOKING FOR NEW SOFTWARE
TOP ROYALTIES PAID
(616) 957-0444





DRACONIAN

You brace yourself as your ship materializes in the enemy sector. Your engine roars to life, and you consult the long-range scanner for the position of the nearest enemy base. As you head for the base, blasting asteroids and space-mines in your path, you suddenly notice a monstrous space-dragon looming before you. Reacting quickly, you dodge his deadly fire-breath and blast him out of existence.

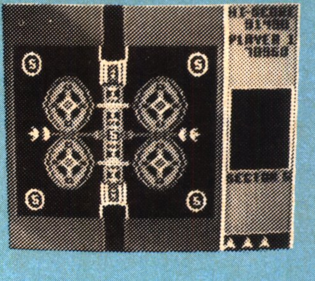
Finally, the enemy base comes into view. Avoiding the enemy fire, you destroy the gun turrets one by one with your rapid-fire torpedoes. Then, with the explosions still echoing around you, you rescue the astronaut who was being held prisoner by the enemy. Your mission is far from over, however, as there are more bases to destroy and more astronauts to rescue before the sector will be secured. And all must be done quickly; if you are too slow, the invincible DRACONIAN will surely seek you out as its next victim.

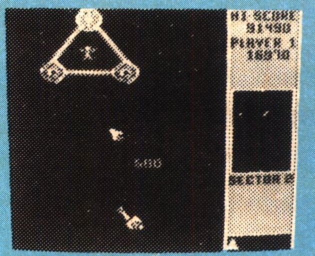
This is it — the single most impressive, awe-inspiring arcade game you can buy for your Color Computer. High-resolution graphics, awesome sound effects, four-voice music, and quality you have to see to believe! Experience the realism of DRACONIAN today!

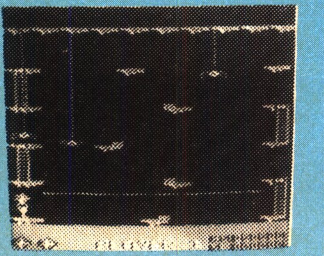
JOYSTICKS REQUIRED

32K MACHINE LANGUAGE

TAPE $27.95 **DISK $30.95**







CRASH

This game is a high resolution Machine Language program with outstanding Arcade type graphics. The game consists of 4 screens. Fly the airplane over and through obstacles. Piloted by "Mario" who also appeard in "The King". The object is to conquer one screen after another but don't "Crash". Great fun for the whole family. For 1 or 2 players. Uses joysticks.

32K MACHINE LANGUAGE

TAPE $24.95 **DISK $27.95**

CHAMBERS

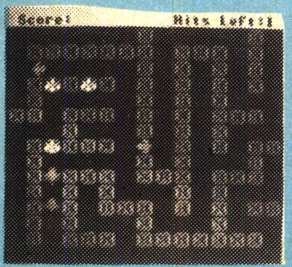
Exciting high resolution graphics game. Multiple screens. Outstanding sound, Chambers is loosely based on Cosmic Chasm. The object in each level is to destroy all of the evil creatures in each room and then go into the main reactor room and blow up the base.

JOYSTICKS REQUIRED

32K MACHINE LANGUAGE

TAPE $24.95 **DISK $27.95**

300
MEN
CHAMBERS
TOM MIX



WAREHOUSE MUTANTS

Journey through the warehouse seeking out the Mutants who are out to destroy you. WATCH OUT! They will push crates trying to crush you! Outstanding realism—high resolution graphics—multiple screens.

JOYSTICKS REQUIRED

16K MACH. LANGUAGE

TAPE $24.95

DISK $27.95

QUIX

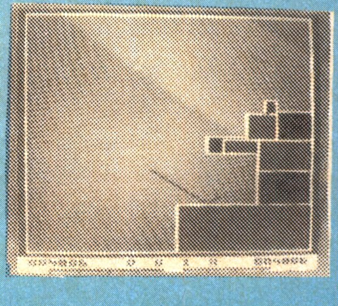
This one is after a popular arcade game with a similar name. Simply frustrating—you'll love it. Done in high resolution graphics with Super Sound.

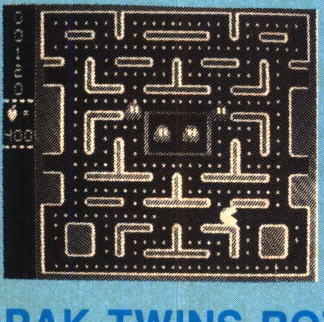
JOYSTICKS REQUIRED

32K MACH. LANGUAGE

TAPE $24.95

DISK $27.95





MS. MAZE

MS. MAZE is remarkable in that it combines brilliant color, high resolution, detailed graphics, and music with a very playable game. Anything that could be done to make the Color Computer look and play like the arcade version has been done. MS. MAZE is without question the closest thing to the arcade Pac games that I have seen for the Coco.

JOYSTICKS REQUIRED

32K MACHINE LANGUAGE

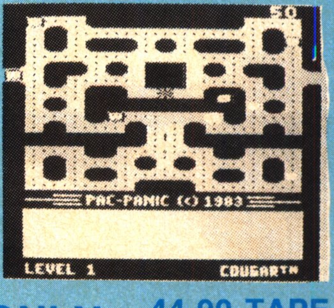
TAPE $24.95 **DISK $27.95**

PAK-PANIC

Pakman is steered thru a maze eating dots and powerpills. Pakman is pursued by four monsters who try to catch and kill him. If Pakman eats a powerpill he becomes powerful and can eat monsters. Monsters try to avoid a powerful Pakman. As monsters are eaten their ghosts appear on the top of the screen. When seven ghosts have appeared one will fly across the screen or they will link together forming a centipede that will travel thru the maze. Pakman has no power against ghosts and centipedes and must avoid them or be killed. **JOYSTICKS REQUIRED**

32K MACHINE LANGUAGE

TAPE $24.95 **DISK $27.95**



PAK TWINS BOTH MS. MAZE & PAK PANIC FOR ONLY **44.90 TAPE** **50.90 DISK**

TOM MIX SOFTWARE
4285 BRADFORD N.E.
GRAND RAPIDS, MI 49506

• ADD $2.50 POSTAGE & HANDLING • (CANADA ADD $3.00) •

• MICHIGAN RESIDENTS ADD 4% SALES TAX •

LOOKING FOR NEW SOFTWARE

TOP ROYALTIES PAID

(616) 957-0444

QUALITY EDUCATIONAL SOFTWARE

VOCABULARY MANAGEMENT SYSTEM

16K Extended basic/32K for printer output

The Vocabulary Management System (VMS) is a series of programs designed to aid a parent or teacher in helping children to learn and practice using vocabulary and spelling words. The 11 programs that comprise the VMS include a full feature data entry/edit program, three printer output programs and 5 vocabulary/spelling game programs. The system's many outstanding features include:

—As many as 300 vocabulary words and definitions may be in the computer's memory at one time.

—Words and definitions may be saved on disk or tape.

—Remarks and/or comments can be saved with word files.

—A disk loading menu allows students to load disk files without typing file names.

—Word lists may be quickly alphabetized.

—The three printer segments allow you to create and print individualized tests, puzzles, word-searches and worksheets.

TAPE $39.95 DISK $42.95

—The printer segments allow full use of your printer's special features.

—The 5 game programs are based on sound educational principles and provide practice in identifying words and matching them with their definitions in a fast-paced set of activities.

FRACTIONS - A Three Program Package - 32 K EXT. BASIC TAPE $30.95 DISK $35.95

MIXED & IMPROPER

1. Review converting mixed numerals and improper fractions.
2. Practice converting mixed numerals to improper fractions.
3. Practice converting improper fractions to mixed numerals.
4. Practice of both types. (Mixed to improper & improper to mixed)
5. Review converting mixed numerals to mixed numerals. (Used in regrouping in substraction)
6. Practice converting mixed numerals to mixed numerals.

EQUIVALENCE

1. Definitions of terms and review of finding equivalent fractions.
2. Practice finding equivalent fractions.
3. Practice finding sets of equivalent fractions.
4. Review of finding if one fraction is equal to, not equal to, less than or greater than another.
5. Practice finding if one fraction is equal to, not equal to, less than or greater than another.

LOWEST TERMS

1. Review of placing fractions into lowest terms by finding the greatest common factor (GCF) of the numerator and denominator.
2. Practice finding the GCF of pairs of numbers.
3. Practice placing fractions into lowest terms by finding the GCF of the numerator and denominator.

TEACHER'S DATABASE

TEACHER'S DATABASE is a program designed to allow a teacher to keep a computerized file of information about his/her students. There are many features that make this program particularly attractive:

- Information on as many as 100 students (or more) may be in the computer at one time.
- Each student may have as many as 20 (or more) individual items of data in his/her record.
- The program will run from cassette or disk.
- Cassette and disk files are completely compatible.
- The program is menu driven.
- Records may be easily changed, deleted, combined or added.
- Information about students may be numerical or text.
- Records may be quickly alphabetized.
- Records may be sorted by various criteria.
- Records may be reordered (ranked) based on test scores or other data.
- Data displayed during a sort may be printed on a printer or saved on disk or cassette as a new file.
- A full statistical analysis of data may be done and sent to the printer.
- Student test scores may be weighted.

REQUIRES 32K EXT. BASIC
TAPE $39.95 DISK $42.95

MATH DUEL

MATH DUEL is a challenging mathematics game that pits you against the computer it a game of wits. You must use all of your knowledge of factors, multiples and prime numbers to develop a strategy that allows you to gather more numbers and thus more points that than the computer.

The game is deceptively simple. You select the size of the playing field that is composed of from 8 to 100 numbers. You must then choose numbers that will give you the maximum number of points and the computer the least number of points. There are only 6 rules.

1. Any number that you chose must have at least one factor still on the playing field.
2. You receive points equal to the face value of the number that you chose.
3. The computer receives points equal to the face value of all of the remaining factors of the number that you chose.
4. All of the numbers that were awarded to you or to the computer are removed from the field.
5. The game continues until there are no numbers with factors remaining.
6. At the end the computer receives points equal to the value of all of the remaining numbers.

32K EXT. BASIC TAPE $24.95 DISK $29.95

ESTIMATE

ESTIMATE is a program designed to help children to practice estimating the answers to addition, subtraction, multiplication and division problems on the Color Computer. it has many features that make its use particularly attractive.

- Up to 5 students may use the program at the same time.
- There are 5, user modifiable, skill levels.
- The acceptable percent error may be changed as a student's skill improves.
- A timer measures the number of seconds used to answer each problem and the total time used for a series of problems.
- If a problem has been answered incorrectly, the student is told the percent error and asked to try again.
- If a problem is answered incorrectly a second time, the student is told the correct answer and the range of acceptable answers is displayed.
- A report is given at the end of each set of problems that includes the number of problems done, the number of problems answered correctly on the first try and the average percent error.
- The (BREAK) key has been disabled so that child will not inadvertently stop the program from running. **REQUIRES 16K EXT. BASIC**

TAPE $19.95 DISK $22.95

PRE-ALGEBRA I INTEGERS

INTEGERS is a series of four programs designed to give students practice in working with addition, subtraction, multiplication, division and the comparison of integers. It has many features that make a very valuable tool for introducing and/or maintaining skills.

- Up to 4 students may use the program at the same time.
- There are 9, user modifiable, skill levels.
- Students are given two opportunities to answer a problem.
- A detailed report of student performance, including number correct on first try, number wrong, total time used and percentage score, is presented at the end of a series of problems.
- The programs will run on a 16K TRS-80 Color Computer with or without disk drive.

Four distinct problem formats are presented. The first presents problems in this format: −12 + −9 = ? The second program presents a problem with missing numerals in this format: −7 − ? = 18. The third program presents a problem with a missing sign: 8 − ?6 = 14. The last program asks the student to determine the relationship (=, ◄ or ►) between two statements 3 −9 (??) −4 −5.

32K EXT. BASIC
TAPE $28.95 DISK $33.95

PRE-ALGEBRA II

The second **PRE-ALGEBRA PACK** is composed of two programs, EQUATION SOLVER AND EQUATION DUEL, that are designed to give students practice in using and solving equations. It has many features that make a very valuable tool for introducing and/or maintaining skills:

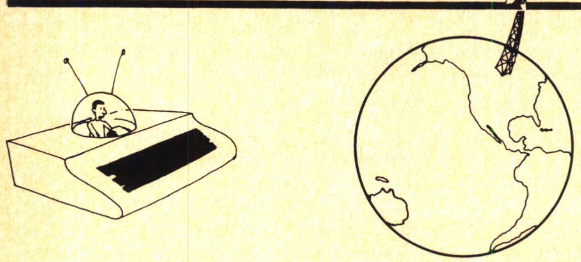
- In both programs students may choose the range of numerical values that will be included in the equations so that the difficulty may change as their skill increases.
- In EQUATION SOLVER the computer secretely generates a random equation, shows the numbers that it used in the equation and the answer and challenges the student to create his/her own equation that uses the same numbers and results in the same answer.
- In EQUATION DUEL the student and the computer race to see who will be the first to create an equation from the same set of random numbers.
- Both programs give detailed reports of the student's and the computer's performance in creating and solving equations including time used, score and percentage correct.

32K EXT. BASIC
TAPE $28.95 DISK $33.95

TOM MIX SOFTWARE
4285 BRADFORD N.E.
GRAND RAPIDS, MI 49506

• ADD $2.50 POSTAGE & HANDLING • (CANADA ADD $3.00) •
• MICHIGAN RESIDENTS ADD 4% SALES TAX •
LOOKING FOR NEW SOFTWARE
TOP ROYALTIES PAID
(616) 957-0444

EARTH TO ED



The Tale Of The Tape

By Ed Ellers
Rainbow Technical Writer

- *I was wondering if there are any differences between tapes or tape inputs on the original CoCo and those on the CoCo 2?*

J.V. Hoell
Kitchener, Ontario

This has come into question in recent months, with reports of tapes that loaded fine on the older models but wouldn't work on the CoCo 2. There were some drastic changes made to the CoCo 2 (and even more on the way), but since I haven't seen the service manual I don't know what if anything has been done to the cassette input and output circuitry. Something I do know is that both CoCo models are designed to work primarily with Radio Shack's tape recorders (CTR-80, CCR-81 and CCR-82). These recorders were reworked to provide reliable operation on the old TRS-80 Model I, and have slightly different audio characteristics from their twins in the regular cassette recorder line. The CoCo is somewhat more forgiving, but different tape recorders (even from Radio Shack) may still give uneven results. Another critical factor is the volume control setting; on the Radio Shack computer recorders it seems to work best at a setting of three.

Where's The RAM?

- *I have a 16K Extended computer, and I recently tried to type in a rather long listing. I got an OM error, and when I turned the CoCo off and back on, and entered* PRINT MEM, *to my surprise it showed 8487 bytes of memory. I examined several locations in memory from zero to 4FFF which indicate that the missing memory does exist, but then I'm a novice at this.*

Pat McKenzie
Marilla, NY

It's there all right, but a lot of it is being used. Typing *PRINT MEM* will give you the size of the RAM area available for your program after variable space, Hi-Res screen pages and the area that BASIC uses to keep track of what's going on. *PCLEARing* more graphics pages will give you less room; conversely, using fewer than four pages will free up some space, but you then lose the use of the higher graphics modes. If you don't have a disk system hooked up, a *POKE 25, 6:NEW* command will drop all the graphics pages (for some reason, you can't just *PCLEAR 0*) and give the same amount of useful RAM space (14631 bytes in a 16K machine) that you would have if you had only Color BASIC.

More MC-10

- *On Page 190 of the November 1984 issue, you mention that the MC-10 will only operate at 600 Baud. In fact, the MC-10 will run at other Baud rates by* POKEing *in a new value (the same way as on the CoCo). Here's the chart:*

Baud	POKE 16932,
300	241
600	118
1200	57
2400	26
4800	10
9600	2

I hope that helps your MC-10 readers.

Bob Rosen, President
Spectrum Projects

It should indeed! Thanks, Bob.

The Case Of The Cases

- *Just a quick comment on your reply to Alexandre Maggioni (October 1984) in regard to identification of the circuit board type. My experience has been that the centered nameplate is not a dead certain way to identify an 'F' board CoCo. I have seen many late model 'E' board units with centered nameplates. This might save some poor fellow a lot of headaches.*

Glenn Gernert
Moscow, ID

Thanks for the tip; I've also heard that some of the earlier 'F' board machines had the old tops. Obviously, since you need to take the top off the machine to do the upgrade, you will find which board you have; the 'C', 'D' and 'E' versions have a large RF shield with a lid that comes off easily (much like a UHF TV tuner, if you've ever seen one) while the 'F' board uses a much smaller shield with lugs under the board that have to be bent outward.

While on the subject of upgrades, I'm told that the very latest CoCo 2 (which is made in Korea) has three of its RAM chips in one row on the board and the other five in another. Instead of W1, the two pads (which are now fairly big and easy to solder across) are outlined by a box marked "64K."

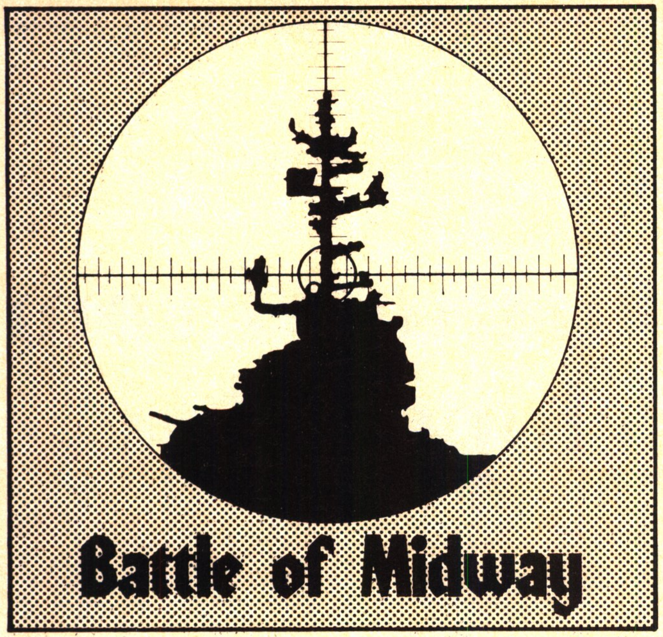
Entering The Dragon's Lair

- *Is there any way I can get CoCo programs on cassette to load and run on my Dragon 32 without hours of editing when the programs are supposedly capable of running in my machine?*

Geoff Whitham
Mackay, Australia

In the case of BASIC programs, all you need to do is save them in ASCII (use *CSAVE "filename" ,A*). Most of the time (when the program is straightforward and doesn't use cute programming tricks) this will work, and on the Dragon 64 (same as the U.S. model) you can usually use CoCo programs in the 64K mode as well.

(Ed Ellers, a RAINBOW *and* PCM *staff member, is a self-confessed electronics fanatic whose other interests include science fiction.)*



COMPANY COMMANDER

CINC PAC — Battle of Midway 32K

Ark Royal's masterpiece game of naval strategy of perhaps the most important battle in the history of the United States Navy. Hi Res graphics, 75% machine language allows player to control as many as 41 separate units on the screen at one time. Command Task Forces 16 & 17 as they play cat and mouse with the Japanese fleet. Maneuver the Hornet, Yorktown and Enterprise into the best position. Set courses and launch search and attack aircraft then hope for the best. Find the enemy fleet, then pick the targets: Akagi, Soryu, Kaga, Yamato and others in this historically accurate game. Relive history, Admiral, and it won't be any easier this time around. Anchors Aweigh.

Game save. Requires disk version to operate on disk. Cassette $27.95.

COMPANY COMMANDER 32K

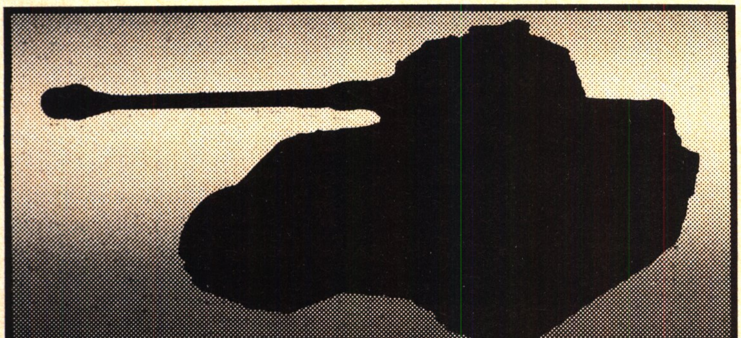
Game module 1 — **House to House.** Ark Royal's squad level WWII infantry combat game.

They said it couldn't be done — a SQUAD LEVEL wargame on a computer — but we've done it. The Line of Sight problem is licked — and the machine language routines really speed things up.

Game Module #1 comes with House to House map and 10 + scenerios involving infantry combat in Aachen, Caen, Arnheim, Stalingrad and other famous WWII city battlegrounds. Combat units include rifle squads, mortar teams, machine gun crews, engineers, and more (depending on the scenerio chosen), leaders, vehicles and other weaponry of WWII. Unique design allows incorporation of future expansion modules.

Choose campaign play and put yourself on the battlefield, Corporal Smith or Jones; collect points toward promotion. Order up smoke from the mortar squad, HE for those dug in units. Take the objective and you might make Major someday. Just don't step on a land mine.

Comes with House to House game map, more than 10 scenerios, on 2 cassettes, or all on 1 disk...$29.95. (Disk included.)



BATTLE OF THE BULGE 32K

Ark Royal's 1 or 2 player game by the author of Battle For Tunis, Bulge recreates operation **Wacht Am Rhein,** Hitler's last desperate gamble of WWII. In none of our games is the fog of war so apparent than in BULGE. You know the Germans have attacked in the Ardennes, but little else. What is their strength? Their objective? Who do you send to repair the huge gap in the American lines? What bridges do you blow? Can you protect the fuel depots? Where are all those Tigers coming from? When will the weather clear?

Historically accurate, and a real challenge whether it be against the computer or a friend. (Just don't humiliate him too badly.) A game you've been waiting for. *Cassette $25.95.*

OTHER ARK ROYAL GAMES...
Some at reduced prices!

Across the Rubicon 32K (Feb '84)*	$24.95
Across the Rubicon 16K (Dec '82)*	$14.95
Mission: Empire 32K (Oct '82)*	$22.95
Mission: Empire 16K*	$17.95
Galactic Taipan 32K (May '84)*	$17.95
Starblazer 32K (Apr '84)*	$17.95
Bomber Command 16K (Jan '84)*	$22.95
Waterloo 32K (Mar '84)*	$22.95
Guadalcanal 32K	$24.95
Battle For Tunis	$24.95
Legatus (Disk only)	$29.95
Kamikaze 32K (Apr '83)*	$19.95
Kamikaze 16K	$14.95

* Denotes Rainbow review month

ARK ROYAL GAMES
P.O. Box 14806
Jacksonville, FL 32238
904-786-8603

Prices on all games include shipping. Florida Residents add 5% tax. All games available on disk, add $3.00. All programs shipped within 24 hours regardless of check or money order. We pay shipping to U.S. and Canada. Others add 10%. Dealer inquiries invited. COD's accepted. All Programs require Color ComPuter™ (Tandy Corp) or TDP System 100 ComPuter™ (RCA).

A program to help students seek information

Gathering Information From The CoCo Encyclopedia

By Steve Blyn
Rainbow Contributing Editor

This month's article continues the thoughts begun last month about information gathering. Today's students are required to gather more information than in the past but are fortunate to have many additional places to gather this information.

One of the services of CompuServe is Grolier's Encyclopedia. Entering *GO AAE* will get you to this CompuServe feature. The students may call this service and let CompuServe search the encyclopedia database for the topic needed. The various places in the encyclopedia that have information on the topic needed will be displayed and the student may choose to view any or all of these sections.

This type of electronic search is fast and efficient. It should not, however, replace completely the ability to look up in a standard encyclopedia one's own information. It is similar to the advent of inexpensive calculators. Even though everyone can afford to own a calculator, it is still necessary to know how to do most of the computations on your own.

Looking up information in an encyclopedia would be a good deal easier if they all consisted of 26 volumes, one for each letter. Of course, this is impractical. Encyclopedias have fewer than 26 volumes and combine information on several letters. There are fewer topics that begin with the letter X than with the letter A. Letter A topics may cover an entire volume on their own. The information that begins with the letter X, however, is almost always combined with the other letters surrounding it. Volume 12, for example, may contain information that begins with the letters W, X, Y, and Z.

Volume 12 might, therefore, appear as 12 W-Z. It is sometimes confusing to newcomers as to where the information for X and Y is. It must be clearly explained to students that they may have to search for where their initial letter is contained.

It's often even more confusing to students to decide which letter to look up in the first place. This requires both thought and practice. The Color Computer, for example , might be listed in a computer encyclopedia under C for computer, T for Tandy, M for microcomputers, or even M for Motorola — the developer of the 6809 chip. A student must learn to think of the various possibilities where the information sought might be contained and then narrow down the choices to the most logical few.

Names are located by the first letter of the last name. Lonnie Falk, for example, would be found in the volume containing F's. The gold rush, however, would be found under the G's rather than the R's. Cars present an even greater challenge as they are usually found under the A's for automobiles.

Fast sports cars would also be found under A's for automobiles. This is not apparent to many students. They might very well waste a lot of time searching in the F, S and C volumes for this information. They should be encouraged to first reason out the most logical choices of where to find their information.

This month's program draws an encyclopedia set and then presents a topic to be looked up. The student's task is to press the number of the volume that would most likely contain information on that topic.

We have included 10 topics for the children to consider. Please consider this a starter set of questions rather than a finished set. Either delete and replace our questions or add to the existing questions. A thinking skill such as what is being considered here cannot possibly be mastered by a student with any given

---

(Steve Blyn teaches both exceptional and gifted children, holds two master's degrees and has won awards for the design of programs to aid the handicapped. He and his wife, Cheryl, own Computer Island.)

set of 10 or 20 questions. It should rather be a skill that builds up to more and more difficult questions to be answered.

Lines 60-430 contain the strings to draw the letters and numbers needed. Lines 470-720 draw the encyclopedia set. Lines 730-830 ask the question "Which book contains information about . . . " Line 810 sends the program to 950 to select from one of the 10 given questions. Lines 880 and 890 decide if the answer is right or wrong and print the appropriate message.

Press ENTER and the program returns to Line 440 to check the counter and give the next question. If the counter indicates that five questions have been done, then a report card is shown on Lines 1080-1110. You may continue or end the program at this point.

The lines that are user modifiable are Lines 970-1060. They contain the questions and answers. There are three parts to each line. QQ$ represents the questions. Each letter of the alphabet stands for its picture. Thus, SAM is represented by S$+A$+M$. AN is the correct volume number. RA$ represents the picture for the correct number. The numbers go from N1$-N9$. These are the lines that we encourage you to modify or add to for your own purposes. Of course, the R value on Line 950 should correspond to the number of questions used.

We encourage you to alter our programs in any way that may help your children or students. As a side benefit to altering programs written by others, you also increase your own programming skills.

Before leaving this month, we would like to pass on some educational news. The College Board Association has decided to include a programming exam in its Advanced Placement Test Schedule. These are tests that high school seniors can take for advanced placement in college. The programming language that they have chosen for the test is PASCAL, rather than BASIC.

This means that to receive advanced college credit, our high school students will need to become proficient in PASCAL. At Computer Island, we have been using the PASCAL version for the Color Computer offered by Deft Systems Inc. We find it easy to get started and use. The manuals are extensive, clear and complete. We feel that high school students would obtain a very good background in PASCAL by using this product.

260	197
550	46
780	206
970	216
END	54

The listing:

```
10 REM"ENCYCLOPEDIA"
20 REM"STEVE BLYN,COMPUTER ISALN
D,NY,1984
30 RS=RND(-TIMER)
40 CLEAR2000
50 PCLS:PMODE3,1:SCREEN1,1
60 REM"THE LETTERS AND NUMBERS"
70 A$="BEHUNU2R4NU2DGL2BGBL6"
80 B$="BEHENR3HER3D4L3BGBL6"
90 C$="BU4ER2FD2GL2HBG2BL4"
100 D$="BEHU2ER3D4L3BGBL6"
110 E$="BER3U2NL2U2L4BG5BL2"
120 F$="BUR4U2NL3U2BG5BL5"
130 G$="BUR4U3HL2GDRBG3BL4"
140 H$="BUU2NU2R4NU2D2BGBL9"
150 I$="BR2BUU4BU2BD7BL8"
160 J$="BUU3ER2FDBG3BL7"
170 K$="BUE2NH2R2ND2U2BG5BL5"
180 L$="BU5R4D4BGBL9"
190 M$="BUNU4E2F2U4BG5BL5"
200 N$="BUU4F4U4BG5BL5"
210 O$="BEHU2ER2FD2GL2BGBL6"
220 P$="BER3U2NU2L3GNFBG2BL4"
230 Q$="BEHU2ERNDNURFD2GL2BGBL6"
240 R$="BEHERNH2R2NU2D2L3BGBL6"
250 S$="BU2FR2EHL2HER2FBG4BL6"
260 T$="BUR2NU4R2BDBL10"
270 U$="BUU3ER2FD3BGBL9"
280 V$="BUU2E2F2D2BGBL9"
290 W$="BUU4F2E2D4BGBL9"
300 X$="BUE2NH2NE2F2BGBL9"
310 Y$="BUE2NU2F2BGBL9"
320 Z$="BUNR4E4L4BG4BDBL2"
330 N1$="BE2NU3DEBFBGBL9"
340 N2$="BENR3HER3U2L4BG5BL"
350 N3$="BENR3HENR2HER3BG5BL5"
360 N4$="BENU4E3L4BG4BL2"
370 N5$="BER4U2L3HER3BG5BL5"
380 N6$="BU2FR2EU2NHGL2HER2BG5BL
4"
390 N7$="BUNR4UE3BG5BL4"
400 N8$="BER2EHEHL2GFNR2GFBGBL6"
410 N9$="BER2EHL2GNFU2ER2FBG4BL6
"
420 SP$="BE4BUBG5BL3":REM"SPACE"
430 LN$="L4":REM"DASH"
440 PCLS:PMODE3,1:SCREEN1,1
450 CT=CT+1:REM"THE COUNTER"
460 IF CT>5THEN 1080
470 COLOR6:FOR T=10 TO 230 STEP
30
480 LINE(T,20)-(T+20,60),PSET,B
490 NEXT T
500 COLOR7:FOR T= 10 TO 230 STEP
 30
510 LINE(T+4,25)-(T+16,30),PSET,
BF
520 NEXTT
530 LINE(0,70)-(255,73),PSET,BF
540 DRAW"C6A2S8BM75,4"+R$+E$+F$+
E$+R$+E$+N$+C$+E$
550 REM"DRAW THE LETTERS ON THE
BOOKS"
560 DRAW"A2C6S4BM16,52"+A$+SP$+B
$
570 DRAW"BM46,52"+C$+SP$+E$
580 DRAW"BM76,52"+F$+SP$+H$
590 DRAW"BM106,52"+I$+SP$+L$
```

```
600 DRAW"BM136,52"+M$+SP$+P$
610 DRAW"BM166,52"+Q$+SP$+S$
620 DRAW"BM196,52"+T$+SP$+V$
630 DRAW"BM226,52"+W$+SP$+Z$
640 REM"DRAW VOLUME NUMBERS"
650 DRAW"C8S8BM25,35"+N1$
660 DRAW"BM55,35"+N2$
670 DRAW"BM85,35"+N3$
680 DRAW"BM115,35"+N4$
690 DRAW"BM145,35"+N5$
700 DRAW"BM175,35"+N6$
710 DRAW"BM205,35"+N7$
720 DRAW"BM235,35"+N8$
730 REM"DRAW-WHICH BOOK CONTAINS
 INFORMATION ABOUT"
740 A1$=W$+H$+I$+C$+H$+SP$+SP$
750 A2$=B$+O$+O$+K$+SP$+SP$
760 A3$=C$+O$+N$+T$+A$+I$+N$+S$+
SP$+SP$
770 A4$=I$+N$+F$+O$+R$+M$+A$+T$+
I$+O$+N$+SP$+SP$
780 A5$=A$+B$+O$+U$+T$
790 DRAW"S8C6BM20,80"+A1$:DRAW+A
2$:DRAW+A3$
800 DRAW"BM30,100"+A4$:DRAW+A5$
810 GOSUB 950
820 DRAW "BM40,120"+QQ$+SP$+SP$
830 DRAW LN$
840 AN$=INKEY$
850 IF AN$="1" THENDRAW N1$ ELSE
 IF AN$="2" THENDRAW N2$ ELSE IF
 AN$="3" THENDRAW N3$ ELSE IF AN
$="4" THENDRAW N4$ ELSE IF AN$="
5" THENDRAW N5$ ELSE IF AN$="6"
THENDRAW N6$ ELSE IF AN$="7" THE
NDRAW N7$ ELSE IF AN$="8" THENDR
AW N8$ ELSE 840
860 REM" REACT TO THE STUDENT'S
ANSWER"
870 DRAW"BM50,140"+SP$
880 IF VAL(AN$)=AN THEN DRAW+C$+
O$+R$+R$+E$+C$+T$:SOUND230,3:RT=
RT+1
890 IF VAL(AN$)<>AN THEN DRAW+A$
+N$+S$+W$+E$+R$+SP$+I$+S$:DRAW+S
P$+SP$+RA$:SOUND75,3
900 FORT=1 TO 200:NEXT T
910 DRAW"S4BM65,162"+P$+R$+E$+S$
+S$+SP$:DRAW+E$+N$+T$+E$+R$+SP$:
DRAW+T$+O$+SP$+G$+O$+SP$+O$+N$
920 LINE(50,160)-(180,170),PSET,
B
930 AN$=INKEY$
940 IF AN$="" THEN 930 ELSE 440
950 R=RND(10)
960 REM"QQ$ IS THE QUESTION AND
AN AND RA$ REPRESENT THE CORRECT
 ANSWER"
 970 IF R=1 THEN QQ$=R$+U$+S$+S$+
I$+A$:AN=7:RA$=N7$:REM"UNION OF
SOVIET SOCIALIST REPUBLICS"
980 IF R=2 THEN QQ$=C$+A$+R$+S$:
AN=1:RA$=N1$:REM"AUTOMOBILE"
990 IF R=3 THEN QQ$=S$+A$+M$+SP$
+F$+I$+N$+K$:AN=3:RA$=N3$
1000 IF R=4 THEN QQ$=R$+E$+D$+SP
$+T$+R$+A$+I$+N$+S$:AN=7:RA$=N7$
1010 IF R=5 THEN QQ$=P$+O$+O$+D$
+L$+E$+S$:AN=2:RA$=N2$:REM"DOGS"
1020 IF R=6 THEN QQ$=B$+O$+B$+SP
$+L$+E$+E$+SP$+J$+R$:AN=4:RA$=N4
$:REM"LEE"
1030 IF R=7 THEN QQ$=R$+O$+C$+K$
+S$:AN=3:RA$=N3$:REM"GEOLOGY"
1040 IF R=8 THEN QQ$=P$+E$+R$+S$
+I$+A$+N$+SP$+C$+A$+T$+S$:AN=2:R
A$=N2$
1050 IF R=9 THEN QQ$=G$+O$+L$+D$
+SP$+R$+U$+S$+H$:AN=3:RA$=N3$
1060 IF R=10 THEN QQ$=M$+I$+A$+M
$+I$:AN=3:RA$=N3$:REM"FLORIDA"
1070 RETURN
1080 CLS:PRINT@10,"REPORT  CARD"
;
1090 PRINT@128,"YOU DID ";RT;"QU
ESTIONS CORRECTLY."
1100 IF RT=5 THEN PRINT@170,"EXC
ELLENT";
1110 PRINT@324,"PRESS <ENTER> TO
 GO ON";:PRINT@360,"OR 'Q' TO QU
IT.";
1120 EN$=INKEY$
1130 IF EN$=CHR$(13) THEN RUN EL
SE IF EN$="Q" THEN 1140 ELSE 112
0
1140 CLS:END
```

RAINBOWfest
Feb. 15-17
Irvine

CANADIAN PAYROLL
OPTIONS 1-4, 6A & B & UTILITY 1
(C) 1983 BY YGS

RAINBOW; EXCEPTIONAL....EXCELLENT.... SOFTWARE... EASY TO USE EVEN FOR NEWCOMERS TO COMPUTERS..................A DEFINITE ASSET TO ANY COMPANY!!

RAINBOW CERTIFICATION SEAL

OPTION 4

CCMAG; .IS FOR YOU..........NO CHANCE OF UNKNOWINGLY LOSING DATA........IS A SPECIALIZED PRODUCT.........MANUAL WELL ORGANIZED EASY TO FOLLOW!!

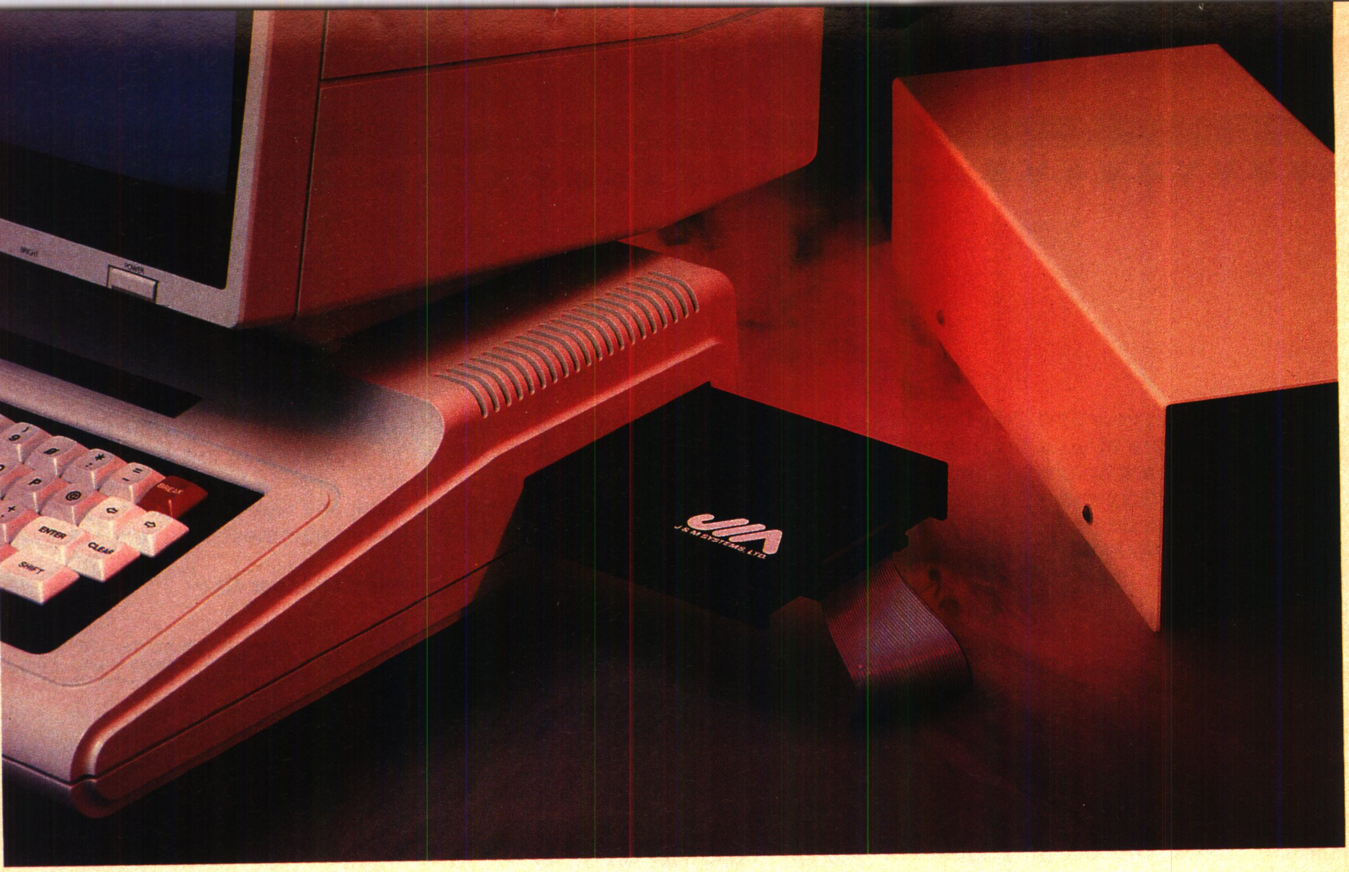
FEATURES
*ALL PROVINCES & TERRITORIES*AUTO. S.I.N VALIDATION
*FORMATTED SCREENS*FULL FORMAT TRAPPING*ANY PRINTER
*ANY PAY PERIOD*BATCHED CHEQUES *DETAILED PAY STUBS
*TOTAL COST/DUTY ALLOCATIONS*YEARLY USER UP-DATABLE
*ALL MEDIA TRANSFER*BACK-UPPABLE*PASSWORD PROTECTED

REQUIRES: 32K ECB COLOUR COMPUTER/TDP100/SINGLE DISK
CONDENSED PRINTER MODE---------------ONLY $149.95 CDN
(ONTARIO RESIDENTS ADD 7% P.S.T)

CALCULATES
*1X OR MULTIPLE PAY RATE*C.P.P*HEALTH*U.I.C*MILEAGE
*GROSSES PAY ANY PERIOD*ACCUMULATED HOURS *EXPENSES

YGS
IS ALL BUSINESS
VISA 1-705-484-5691
6PM-9PM EST ONLY PLEASE

PO BOX 208
BRECHIN, ONTARIO
LOK 1BO



Heat Up Your COCO With J&M'S *Hot* Disk Controller

Upgrade your COCO by adding **JDOS** advanced disk operating system, top quality disk drive, and **VIP-Writer***, a powerful word processor.

J&M Systems offers this package for a remarkably low price that gives you a plug-compatible disk drive for **both** the original COCO and the COCO-2.

Gold contacts assure reliability, built-in digital phase locked loop means NO adjustments, and disc operations are supported by **JDOS.** The controller also supports RS DOS, FLEX*, and OS/9*.

JDOS implements all RS DOS Basic commands, plus many more, including Auto line numbering, DOS to boot OS/9, and RUNM to load and run machine language programs.

You may also **choose** to format disks 40 track (single or double side) as well as 35 track RS compatible. Up and Down arrow keys support **scrolling:** a feature everyone wants!

VIP-Writer, gold-edged **JFD DISK CONTROLLER** card, **JDOS** in ROM, complete drive, cable, and Manuals: all for only **$379.**

J&M SYSTEMS:
The Driving Force For Your Color Computer!

To Order Fill Out This Coupon or Call 505/265-1501

__________ I'd like more information on these products:

__________ PLEASE SEND ME: A top-quality complete SSDD 180K disk drive with cable, a gold-edged JFD Disk Controller card (JDOS in ROM), VIP-WRITER word processing program, and manuals all for only $379.

Name ______________________________

Address ______________________________

City/State/Zip ______________________________

__________ I WANT TO USE VISA® OR MASTERCARD®

Card # ____________________ Exp. Date __________

Signature ______________________________

__________ Enclosed is my check or money order.

J & M SYSTEMS, LTD.

137 UTAH NE • ALBUQUERQUE, N.M. 87108 • 505/265-1501

---

*VIP-Writer is a registered trademark of Soft Law
*FLEX is a registered trademark of Technical Systems Consultants, Inc.
*OS/9 is a registered trademark of Microware, Inc.

RAINBOW

Give us your best: Join the ranks of these courageous CoCoists in showing the Color Computer world your high score at your favorite micro-diversion. We want to put your best effort on record in THE RAINBOW's Scoreboard column. All entries must be received by the first of the month to be eligible for the following month's Scoreboard. They must include your *full* name, address, game title, company name and, of course, your high score. Each individual is limited to three score entries per month. Send your entries to Scoreboard, c/o THE RAINBOW.

★ **New Number One** ● **Last Month's Number One**

ANDRONE *(Radio Shack)*

27,805	★John Marcogliese, Eastchester, NY
27,450	Alan Bucior, Victoria, British Columbia
18,290	Bill Sain, Charlotte, NC
17,170	Jamie Schultz, Ontario, Canada

ANNIHILATOR *(Chromasette)*

18,600	★Michael Cooney, Mansfield, OH
1,000	Matthew Kromeke, Albuquerque, NM

BAG-IT-MAN *(Aardvark)*

418,790	★Cornelius Caesar, Hofheim, West Germany
310,400	Eric Lecrouart, Ottawa, Ontario
109,620	Ronald Gates, Grand Rapids, MI
101,400	Daniel Belisle, Montreal, Quebec
43,030	Mario Asselin, Hauterive, Quebec

BASEBALL *(Radio Shack)*

460-0	★Walter Trainlips, Janesville, WI
324-0	Michael Rosenberg, Prestonsburg, KY
296-0	Seth Newman, Yardley, PA
223-0	Chris Young, Ft. Worth, TX
176-0	Andrew King, Vancouver, British Columbia
56-0	Stephen Squires, Lewisporte, Newfoundland

BATS AND BUGS (THE RAINBOW)

24,600	★Michael Rosenberg, Prestonburg, KY
3,600	Apollo Latham, Rich Square, NC
3,300	Joey Lewis, Cabin Creek, WV
3,200	Denise Morin, Hudson, MA
2,950	Susan Ballinger, Uxbridge, Ontario

BUSTOUT *(Radio Shack)*

42,000	★Derrick Kardos, Colonia, NJ
42,000	★Martin Klein, Skokie, IL
34,700	Sara Hennessey, Golden Valley, MN
28,720	Perry Denton, New Baden, IL
27,880	Mike Wells, Pittsburgh, PA
24,000	Charlie Salmon, Madison, WI

BUZZARD BAIT *(Tom Mix)*

6,447,950	★Jon Griffith
5,488,250	Jim Kennett
2,983,350	Blossom Mayor, East Greenwich, NY
2,902,700	Michael Popovich, Nashua, NH
2,087,650	Edmund Greene, Nashua, NH
143,850	Chris Kawchuk, Delta, British Columbia

CANDY CO. *(Intracolor)*

451,382	★Randall Edwards, Dunlap, KS
99,516	Tiffany Morgan, Lookout Mtn., TN

CANYON CLIMBER *(Radio Shack)*

8,990,000	★Glen Giacomelli, Woodbridge, Ontario
2,326,200	Scott Oberholtzer, Lexington, MA
1,603,400	Shen Mansell, Calgary, Alberta
1,571,300	Jeff Weaver, Gordonville, PA
1,426,600	Sean Whitley, Arvada, CO
248,500	Scott Bishop, Warren, NJ
145,200	Roberta Pederson, Athabasca, Alberta
112,400	Joseph DiBattista, Brooklyn, NY

CASHMAN *(MichTron)*

$20,750	★Melvin Pettuk, Nampa, Alberta
$19,330	Dan Ralston, Janesville, WI

CAVERN COPTER (THE RAINBOW)

1213	★Doug Schwartz, Glendale, AZ
968	Michael Mefferd, Wren, OH
790	John Rivers, North Adams, MA
760	David Figel, Sardis, OH
747	Susan Ballinger, Uxbridge, Ontario

CAVERNS OF DEATH (THE RAINBOW)

2100	★Jeff Loeb, Mobile, AL

CHOPPER STRIKE *(MichTron)*

162,400	★Andrew Figel, Sardis, OH
130,200	Benny Pischke, Lloydminster, Saskatchewan
87,600	David Figel, Sardis, OH
83,300	Doug Masten, Macon, OH
72,100	Lisa Siclari, Staten Island, NY

CLOWNS & BALLOONS *(Radio Shack)*

143,300	★Moe Tindell, Sebring, FL
116,475	Jeffrey Kochs, Grove City, OH
116,470	Colin Kerridge, Ladysmith, British Columbia
114,140	Cheryl Pratt, Moab, UT
110,475	Andrew Truesdale, Ferguson, MO

COLOR GOLF III *(Tom Mix)*

13/59	★Don Ward, Groton, CT

COLOR HAYWIRE *(Mark Data)*

4,000	★Peter Hoven, Eckville, Alberta

COLORPEDE *(Intracolor)*

10,001,051	★Mark Smith, Santa Ana, CA
5,756,808	Scott Oberholtzer, Lexington, MA
3,355,248	Scott Drake, Pine City, NY
2,614,230	Jerry Petkash, Warren, MI
2,547,299	Rich McGervey, Morgantown, WV
446,871	Ellen Ballinger, Uxbridge, Ontario
101,556	James Battista, Brandon, FL

COSMIC CLONES *(Mark Data)*

10,000	★Susan Ballinger, Uxbridge, Ontario

CRYSTLE CASTLES *(Thundervision)*

584,177	★Carol Moore, Wingham, Ontario

CU*BER *(Tom Mix)*

204,575	★Martin C. Klein, Skokie, IL
201,190	Jay Pribble, Davenport, IA
196,090	Randall F. Edwards, Dunlap, KS
49,510	Doug Kleir, Grand Rapids, MI

DANGER RANGER *(Med Systems Software)*

5,181	★Chris Young, Ft. Worth, TX
2,122	Frank Unger, Manchester, MO
2,002	Robbie Sablotny, Mt. Zion, IL
1,962	Michael Rosenberg, Prestonsburg, KY
1,890	Fred Thompson, Saugus, MA

DEVIL ASSAULT *(Tom Mix)*

4,569,305	★David Fitzpatrick, Ogallala, NE
3,096,900	●Chad Barry, Rochester, NH
3,048,400	Brent Murphy, Mesa, AZ
2,890,000	Rich Van Manen, Grand Rapids, MI
1,762,980	Michael Rosenberg, Prestonsburg, KY

DEVIOUS *(Spectral Associates)*

70,150	★Mark Day, Ft. Worth, TX

DOODLEBUG *(Computerware)*

1,740,000	★Robin Rooke, Winnipeg, Manitoba
787,550	Carol Moore, Wingham, Ontario

DOUBLE BACK *(Radio Shack)*

1,125,000	★Mark Hurst, Sheridan, OR
1,080,000	Phillipe Duplanties, St. Jerome, Quebec
639,210	Paul Baker, Pittsburgh, PA
605,890	Peter Sherburne, Highland, CA
474,040	Paul Moritz, Butte, MT

DOWNLAND *(Radio Shack)*

38,954	★Mary Ward, Groton, CT
23,000	Dan Feinstein, Mobile, AL
23,000	Doug Feinstein, Mobile, AL
22,304	Don Ward, Groton, CT
13,358	●Bryan Durall, Greenville, KY
12,936	Fred Turner, Laredo, TX

DRACONIAN *(Tom Mix)*

395,400	★Peter Kral, Arcata, CA
326,180	George Hoffman, Shavertown, PA
190,840	Kyle Keller, Overland Park, KS
139,010	Paul MacArthur, Gillette, WI
86,600	James Toth, Punxsutawney, PA

DUNKEY MUNKEY *(Intellectronics)*

1,936,000	★Tim Greenen, Sterling Hts., MI
1,244,400	Jack Baran, Bensalem, PA
1,015,000	Kyle Keller, Overland Park, KS

EL BANDITO *(Mark Data)*

955	★Janie Hoven, Spruce View, Alberta
955	★Peter Hoven, Eckville, Alberta

ELECTRON *(Tom Mix)*

45,510	★John Sandberg, Concord, CA
41,750	Michael Rosenberg, Prestonsburg, KY
35,400	Chad Barry, Rochester, NH
31,750	Liz Baker, Marissa, IL
22,990	Alan Morris, Chicopee, MA

FIRE COPTER *(Adventure International)*

112,550	★George Dougherty, Hampton, VA
107,370	●Chris Hafey, Auburn, CA
97,390	Sam Hughes, Colton, CA
78,860	Woody Farmer, Acme, Alberta
53,280	Kevin Marsh, Bokeelia, FL

FLYBY *(Chromasette)*

104,980	★David Finberg, Annandale, VA
32,940	Brett Johnson, Columbus, OH
28,910	Ron Suedersky, Universal City, TX
20,110	Rick Mansell, Calgary, Alberta
16,670	Michael Rhattigan, Cory, NC

FOODWAR *(Arcade Animation)*

94,905	★Stephane Asselin, Hauterive, Quebec

THE FROG *(Tom Mix)*

156,000	★Evelyn Gagnon, North Bay, Ontario
63,440	Liz Baker, Marissa, IL

FROGGIE *(Spectral Associates)*

86,660	★David Garozzo, Morrisville, PA
84,440	Bill Ide, Newark, DE
74,050	Mike Garozzo, Morrisville, PA

FURY *(Computer Shack)*

48,100	★Mario Asselin, Hauterive, Quebec

GALACTIC ATTACK *(Radio Shack)*

48,870	★Tony Boring, Armagh, PA
48,520	Paul Sanecki
16,760	David Chabot, Granby, Quebec

GALAGON *(Spectral Associates)*

760,340	★Robert Ahlgrim, Hutchinson, KS
647,230	Jack A. Tindle, Soquel, CA
618,800	Gary Jones, Dale, TX
393,660	Mark Nichols, Birsay, Saskatchewan
367,990	Randall Edwards, Dunlap, KS

GHOST GOBBLER *(Spectral Associates)*

1,007,430	★Todd Brannam, Charleston Hts., SC
889,800	Mary Gassaway, Charlotte, NC
825,250	Randy Gerber, Wilmette, IL
753,900	Raymond Gassaway, Charlotte, NC
536,260	Andrew King, Vancouver, British Columbia

GLAXXONS *(Mark Data)*

7,746	★Stephane Asselin, Hauterive, Quebec

GONE FISHING (THE RAINBOW)

29	★Eric Burk, Williamsvill, NY
12	Lisa Ballinger, Uxbridge, Ontario
12	Kevin Oberberger, Sparks, NV
11	Brian Austin, New Salisbury, IN
11	Emily Doubt, Deep River, Ontario
9	Tim Hoven, Eckville, Ontario
9	Paul Skinner, Winnipeg, Manitoba

GRABBER *(Tom Mix)*

147,600	★Brian Foley, Blackstone, MA
129,100	Blossom Mayor, East Greenbush, NY
70,600	Michael Corman, Lafayette, IN
31,900	Stephane Asselin, Hauterive, Quebec
27,750	Ellen Ballinger, Uxbridge, Ontario

GROBOT *(Childrens Computer Workshop)*

14,340	★Kristi Anliker, Terril, IA

HEIST (THE RAINBOW)

2,100	★Sergio Waisser, Mexico City, Mexico
1,500	Susan Ballinger, Uxbridge, Ontario
1,500	Julio Comello, Scarborough, Ontario
1,500	Kirstie Compton, Suffield, CT
1,500	Andy Dater, Medford, OR
1,500	David Figel, Sardis, OH
1,500	Tim Hoven, Eckville, Alberta
1,500	Joel Lombardi, Newark, DE
1,500	Jason Morrison

SCOREBOARD

1,500	Jeff Roberg, Winfield, KS
1,500	Brendan Smith, Coral Springs, FL
1,500	Kevin Speight, Bridgewater, Nova Scotia
1,500	Rupert Young, Sheffield, MA

THE JUNGLE (THE RAINBOW)

870,333	Tony Boring, Armagh, PA
644,694	Matt Hazard, Columbia Station, OH
4,230	Doug Schwartz, Glendale, AZ
3,048	Jon Hobson, Plainfield, WI

JUNIOR'S REVENGE *(Computerware)*

4,897,000	★Chris Oberholtzer, Lexington, MA
3,007,000	Tim Brown, Clio, MI
2,154,900	Scott Kubota, Whitby, Ontario
2,099,300	Shawn McAlpin, Louisville, KY
1,220,000	Edwin Prather, Oxnard, CA

KATERPILLAR ATTACK *(Tom Mix)*

65,682	★Jason Morrison
38,676	James Lafave, Williamstown, MA
31,672	●Scott Fairfield, Williamstown, MA
18,949	Vadim Gotovsky, Toronto, Ontario

THE KING *(Tom Mix)*

10,000,100	★Mark Smith, Santa Ana, CA
6,299,300	Scott Oberholtzer, Lexington, MA
4,040,300	Andy Truesdale, Ferguson, MO
3,343,000	Corey Friedman, Minnetonka, MN
2,410,200	Candy Harden, Birmingham, AL

KLENDATHU *(Radio Shack)*

1,962,741	★Jay Pribble, Davenport, IA
1,437,435	Stephen Squires, Lewisporte, Newfoundland
1,245,821	John Sandberg, Concord, CA
1,193,350	Tommy Parker, Talladega, AL
1,182,685	David L. Ferris, Shickshinny, PA

KRON *(Oregon Color Computers)*

12,275	★Mario Asselin, Hauterive, Quebec

LASERWORM & FIREFLY *(*THE RAINBOW*)*

200,350	★Allan Ballard, Ft. Wayne, IN
116,622	Michael Rosenberg, Prestonburg, KY
94,748	Brian Chafin, Weyers Cave, VA
67,515	Marco Swinkels, Beneluxlaan, Netherlands
57,285	Chris Johnston, Carlisle, Perth, Australia

LEMANS *(Spectral Associates)*

1:19	★Paul MacArthur, Gillette, WI

MARATHON (THE RAINBOW)

103,460	★Chris Kawchuk, Delta, British Columbia

MEGA-BUG *(Radio Shack)*

60,000	★Robin Worthem, Milwaukee, WI
21,130	Richard Hansen, Inkom, ID
18,902	John Tiffany, Washington, DC
15,999	Ed Mitchell, Ragged Mountain, CO
14,297	Aleisha Hemphill, Los Angeles, CA

METEORS *(Spectral Associates)*

26,580	Kevin Endlich, Perry Hall, MD
16,870	Keith Marsh, Bokeelia, FL
15,660	David Bryan, Kentwood, LA
14,200	Craig Dutton, Goose Bay, Labrador

MICROBES *(Radio Shack)*

178,550	★Apollo Latham, Rich Square, NC
144,350	Theodore Latham Jr., Rich Square, NC
59,960	Steven Allen, Sharpsburg, MD
40,850	Joey Lewis, Cabin Creek, WV
30,850	Ronald Gates, Grand Rapids, MI
14,820	Ellen Ballinger, Uxbridge, Ontario

MONKEY KONG *(Med Systems)*

678	★Peter Hoven, Eckville, Alberta

MOON HOPPER *(Computerware)*

114,540	★Susan Ballinger, Uxbridge, Ontario
78,820	Brian Austin, New Salisbury, IN
59,970	Cole McDonald, St .Cloud, MN
53,570	Robert Harmon, Virginia Beach, VA

MR. DIG *(Computerware)*

2,520,650	★Thomas Henry, Boca Raton, FL
2,301,000	●Jeff Roberg, Winfield, KS
1,976,500	Tim Magnusen, Lafayette, TN
1,392,100	John Ishman, Saginaw, MI
784,500	Marc Harris, Colorado Springs, CO
502,100	Dan Ralston, Janesville, WI
240,350	Melvin Pettuk, Nampa, Alberta

MS. GOBBLER *(Spectral Associates)*

67,550	★Dan Ralston, Janesville, WI
42,680	Jason Morrison

MS. MAZE *(Tom Mix)*

94,020	★Chu-Kia Wang, Madison, WI
64,120	Brett Johnson, Columbus, OH
42,240	Charlie Salmon, Madison, WI

MUDPIES *(MichTron)*

365,900	★Glenn Wasson, Castleton, NY
185,200	●Bertha Jeffries, San Bernardino, CA
181,200	Anthony van Dijk, The Pas, Manitoba
173,900	Andrew Chin, Austin, TX
164,000	Paul Baker, Pittsburgh, PA
99,600	Stephane Asselin, Hauterive, Quebec

NINJA WARRIOR *(Programmer's Guild)*

151,100	★Douglas Rodger, Harvard, MA
106,300	Bud Seibel, Tumbler Ridge, British Columbia
105,200	Martin W. Grimm, Elkview, WV
102,400	Christopher Gelowitz, Claresholm, Alberta
86,100	Ryan Sambrook, Miami Lake, FL

OFFENDER *(American Business Computers)*

113,000	★Kevin Marsh, Bokeelia, FL
103,450	Julio Comello, Scarborough, Ontario

PAC DROIDS *(Programmer's Guild)*

2,467,810	★Steve Schutjer, Hazel Green, WI

PAC 'EM (THE RAINBOW)

2,372	★Stephanie Gregory, Coco Solo, Panama
2,301	Lawrence Gore, Glencoe, AL
2,097	Dr. James Peterson, Radcliff, KY
2,059	Art Hartsough, Ft. Wayne, IN
1,999	Kevin R. Hubbard, Huntington, WV
1,912	Robin Rooke, Winnipeg, Manitoba
669	Jeff Loeb, Mobile, AL

PAC-TAC *(Computerware)*

4,230	★David Bryan, Kentwood, LA

PARA-JUMPER (THE RAINBOW)

3,118	★Jon Clevenger, Lima, OH
822	●Peter MacLeod, Montague, Prince Edward Island
783	Ronald Gates, Grand Rapids, MI

PIPELINE (THE RAINBOW)

302	★Lisa Ballinger, Uxbridge, Ontario

PLANET INVASION *(Spectral Associates)*

177,900	★Russ Rosen, Cardiff, CA
67,300	Doug Seibel, Tumbler Ridge, British Columbia

POLARIS *(Radio Shack)*

261,341	★Nico Swinkels, Beneluxlaan, Netherlands
111,273	Scott Daley, Biloxi, MS
109,825	Ed Meyer, Vancouver, British Columbia
81,041	Andy Lehtola, Mound, MN
75,280	Rich Van Manen, Grand Rapids, MI

POLTERGEIST *(Radio Shack)*

6,730	★Walker Astle, Grimsby, Ontario
6,600	Ray Suplee
4,575	Brad Lacerda, Gloucester, MA
4,525	Matt Hazard, Columbia Station, OH
4,395	Joseph DiBattista, Brooklyn, NY
2,105	Lisa Ballinger, Uxbridge, Ontario

POOYAN *(Datasoft)*

1,511,050	★Jeff Connell, Winona, MN
1,393,500	Lori Heape, Hutchinson, KS
1,138,500	Linda Cote, Montreal, Quebec
890,850	Jerry Morgan, Independence, MO
480,450	Bernd Pruetting, Scheibenhardt, West Germany
385,332	Mary Ward, Groton, CT

POPCORN *(Radio Shack)*

64,380	★Susan Rushing, Tucson, AZ
57,860	Jeffrey Kochs, Grove City, OH
48,930	Paul Baker, Pittsburgh, PA
48,520	Nicole Freedman, Wellesley, MA
47,110	Darin Martin, Oakland, CA
37,300	Ellen Ballinger, Uxbridge, Ontario
28,850	Brian Bennett, Charleston, SC
23,700	Jon Clevenger, Lima, OH

PROJECT NEBULA *(Radio Shack)*

1,600	★Dan Heater, Cortland, OH
1,410	Brad Lacerda, Gloucester, MA
1,270	Theodore Latham Jr., Rich Square, NC
1,235	Joey Lewis, Cabin Creek, WV
1,145	Barry Logan, Pinckneyville, IL

PYRAMID *(Radio Shack)*

220/113	★John Dupre, Mobile, AL
220/130	Cornelius Caesar, Gundelhardtstr, West Germany
220/130	George R. Fairfield, Victoria, British Columbia
220/133	Robert Dickau, Sacramento, CA
220/136	Andy Nelson, Winona, MN
220/137	Chris Cope, Central, SC
220/168	Jeff Murphy, North Andover, MA

Q-NERD (THE RAINBOW)

6,512,020	★Ray Ravalitera, Bethune, France
326,810	David Chabot, Granby, Quebec
184,780	Ray Suplee
181,920	Susan Bennington, Pensacola, FL
130,000	Robert Dickau, Sacramento, CA
64,400	Tim Hoven, Eckville, Alberta
57,360	Nicole Freedman, Wellesley, MA

QUIX *(Tom Mix)*

708,206	★Wib Merrithew, Oshawa, Ontario
496,165	Evelyn Gagnon, North Bay, Ontario

RAAKA-TU *(Radio Shack)*

50	★Mike Bubb, Grafton, OH
50	★Chris Cope, Central, SC
50	★Richard Gain, Tyler, TX
50	★Michael Thomas, Flint, MI
40	David Joyner, Raleigh, NC
25	Brian Sobolewski, Orange Park, FL
20	Ronnie Wattanapanich, Sun Valley, CA

RAINBOW ROACH (THE RAINBOW)

283,500	★Andy Lehtola, Mound, MN
212,700	Jon Kroll, Greendale, WI
146,800	Mark Welte, Baxter, TN
124,800	Cheryl Endlich, Perry Hall, MD
122,700	Peter MacLeod, Montague, Prince Edward Island

REACTOIDS *(Radio Shack)*

931,395	★Linda Mobbs, Pt. Huron, MI
702,125	Jeff Loeb, Mobile, AL
203,800	Andrew Lehtola, Mound, MN
88,615	Robbie Anderson, Monrovia, CA

RETURN OF THE JET-I *(ThunderVision)*

406,788	★Chris Russo, Miami, FL
395,029	Joseph Russo, Miami, FL
389,453	●Gary Bachtel, Huntsville, AL
208,602	Robert Buerkle, Conway, PA
188,000	Todd Kaplan, Lawrenceville, NJ

ROBOTTACK *(Intracolor)*

2,516,050	★Horace Hamilton, Calgary, Alberta
2,437,000	Mike Scharf, Fremont, OH
2,329,000	Edwin Prather & Cory Soper
2,216,950	Randy Hankins, Tabor, IA
1,922,200	Erik Merz, Noblesville, IN

SANDS OF EGYPT *(Radio Shack)*

80	★Bob Dewitt, Blue Island, IL
102	Chu-Kia Wang, Madison, WI

SCOREMAN *(The Cornsoft Groupe)*

302,710	★Martin Meyer, Eugene, OR

SHAFT *(Prickly-Pear)*

12,220	★Jason Moore, Wingham, Ontario
9,980	Tara Moore, Wingham, Ontario

SHAMUS *(Synapse Software)*

72,000	★Todd Kaplan, Lawrenceville, NJ
17,185	Paul MacArthur, Gillette, WI

SHOOTING GALLERY *(Radio Shack)*

149,940	★Robert Wallace, Waldorf, MD
80,220	Vernell Peterson, Radcliff, KY
44,870	Mark Nichols, Birsay, Saskatchewan
44,480	R. Duguay, St. Bruno, Quebec
35,080	Greg Erieau, Columbus, OH

SKIING *(Radio Shack)*

05.85	★John Hokpins, Greenville, SC
12.02	Brian Austin, New Salisbury, IN
12.08	Kelly Kerr, Wentzville, MO
13.73	Janell Stroshane, Ashland, WI
21.35	Jean-Claude Taliana, Brossard, Quebec

MORE... RAINBOW SCOREBOARD

SKRAMBLE *(Tom Mix)*
46,440 ★Steve Schutjer, Hazel Green, WI
SLAY THE NEREIS *(Radio Shack)*
344,115 ★Ed Meyer, Vancouver, British Columbia
47,442 Joseph DiBattista, Brooklyn, NY
SNAKER (THE RAINBOW)
1:26 ★Dan Sobczak, Mesa, AZ
1:59 Baiju Shah, Deep River, Ontario
2:21 Eric Burk, Williamsvill, NY
SOLO POKER *(Data Soft)*
760 ★Marie Eckhardt, Madison, NJ
SPACE INVADERS *(Spectral Associates)*
47,670 ★Donald Williams, Prince George, British Columbia
SPACE RACE *(Spectral Associates)*
42,475 ★Michael Hoven, White Rock, British Columbia
SPIDERCIDE *(Radio Shack)*
1,700 ★Doug Feinstein, Mobile, AL
1,400 Joel Feinstein, Mobile, AL
250 Don Ward, Groton, CT
STARBLAZE *(Radio Shack)*
11,000 ★Steve Schutjer, Hazel Green, WI
9,700 Robbie Sablotny, Mt. Zion, IL
9,050 Mark Welte, Baxter, TN
6,250 Ronnie Wattanapanich, Sun Valley, CA
STAR TRADER *(Computerware)*
43 days ★Steve Hartford, Glendale, CA
STELLAR LIFE-LINE *(Radio Shack)*
33,100 ★Kenn Booth, Grand Rapids, MI
16,920 Jeff Loeb, Mobile, AL
TIME BANDIT *(MichTron)*
413,620 ★Doug Seibel, Tumbler Ridge, British Columbia
248,530 Sally Naumann, Hailey, ID
243,620 Mark Wooge, Omaha, NE
225,950 Chris Oberholtzer, Lexington, MA
142,200 Fred Naumann, Hailey, ID
35,670 Carol Moore, Wingham, Ontario
24,740 Melvin Pettuk, Nampa, Alberta
TOUCHSTONE *(Tom Mix)*
98,500 ★Glenn Wasson, Castleton, NY
88,300 ●Michael Mefferd, Wren, OH
65,520 Kevin Marsh, Bokeelia, FL
TRAILIN' TAIL (THE RAINBOW)
105,300 ★Jerry Dill, Frankfort, MI
87,345 ●Philip Parent, Smiths Falls, Ontario
76,275 Michael Rosenberg, Prestonsburg, KY
74,395 Jean-Marc Parent, Smiths Falls, Ontario
33,454 Kenneth Bergenham, Lawton, MI
29,990 Stephanie Gregory, Coco Solo, Panama
TRAPFALL *(Tom Mix)*
120,406 ★Keith Marsh, Bokeelia, FL
114,642 Eric Lecrouart, Ottawa, Ontario
114,322 David Joyner, Raleigh, NC
113,408 Rich Trawick, N. Adams, MI
112,596 Kanti Dinda, Kingston, Ontario
83,750 Chris Kawchuk, Delta, British Columbia
TRIPLE YAHTZEE *(Software Factory)*
2,474 ★Robert Larson, Belfair, WA
TUT'S TOMB *(Mark Data)*
163,060 ★Michael McCafferty, Oceanside, CA
158,000 Chris Russo, Miami, FL
106,460 Eileen Kaakee, Royal Oak, MI
104,360 Gary Marshall, Layton, UT
60,780 Stephane Asselin, Hauterive, Quebec
WACKY FOOD *(Arcade Animation)*
241,200 ★Todd Kaplan, Lawrenceville, NJ
227,900 Jon Jenkins, Milner, GA
105,100 Stephane Asselin, Hauterive, Quebec
WHIRLYBIRD RUN *(Spectral Associates)*
516,450 ★Dan Shargel, Arroyo Grande, CA
283,100 Nathan Russell, Minco, OK
194,650 Jean-Georges Demathieu, Paris, France
174,750 George Hoffman, Shavertown, PA
157,000 Hughens Bien-Aime, Montreal, Quebec
WILDCATTING *(Radio Shack)*
33,090 ★Jack Ballinger, Uxbridge, Ontario
ZAXXON *(Datasoft)*
2,057,800 ★Chris Oberholtzer, Lexington, MA
1,510,000 James Quadrella, Brooklyn, NY
666,000 Andy Green, Whitehall, PA
401,900 Mike Hughey, King George, VA
370,400 Chris Coyle, Selden, NY

— Tamara Solley

SCOREBOARD POINTERS

In conjunction with THE RAINBOW's Scoreboard, we offer this column of pointers for our game-playing readers' benefit. If you have some interesting hints and tips, we encourage you to share them by sending them to the Scoreboard, c/o THE RAINBOW.

COINING A PHRASE

Scoreboard:

I have heard of many Adventurers who are stuck in the pit in game 1 of *The Amazing Adventures of Karrak* (THE RAINBOW, Feb. '84). To pass the pit you have to put a coin in the slot, but there's no way to get the coin (at least I haven't found one anywhere in the listing). Add to the end of Line 110 of Listing 2 (game 1) the following:

```
:C(7)=2
```

This change will reveal the secrets that await Karrak in his journey.

Jyri J. Virkki
Rio Piedras, Puerto Rico

GETTING DOWN TO ESSENTIALS

Scoreboard:

For everyone who wants to know the essential words of the different Adventure games such as *Bedlam, Raaka-Tu, Pyramid,* etc., simply type in the following:

```
FOR X = 1536 TO 16383: POKE 1024
+(X AND 511), PEEK(X): NEXT
```

The scrolling can be stopped by pressing SHIFT @ and started again by pressing any key. You will notice that meaningful words appear by the end of the programs.

Georges Pagace
St. David de l'Auberiviere, Quebec

PLANEBUSTERS

Scoreboard:

The method of killing all planes in *Zaxxon* (described in Oct. '84 "Scoreboard Pointers") works fine, but there is a much simpler way.

After you are safely over the fortress wall, before the planes come, position your joystick all the way up and all the way to the right. Your ship will move all the way down and to the right. Then fire like a hyperactive bongo player. This works perfectly on *all* levels, as long as you keep firing. Also, to destroy Zaxxon himself, position your ship at exactly 2½ on the height scale and fire at least six shots on the missile under his left arm — this is his only vulnerable spot.

To those who have 32K or 64K CoCos and are trying to solve *Bedlam* or *Raaka-Tu*, try the following:

1) Turn on CoCo and TV
2) POKE 25,64:POKE 16384,0:NEW ENTER
3) Enter the following short program:

```
5 FOR X=15000 TO 16383
10 PRINT CHR$(PEEK(X));
15 NEXT X
```

4) CLOADM "WHATEVER" ENTER and wait for loading
5) RUN ENTER

At first you will see only garbage, but wait for a few moments and you will see all available commands. (This method may also work for *Pyramid.*)

If you have almost solved *Raaka-Tu*, but only get out with 20 points, this is not because you had to drop the coin. You cannot complete the Adventure without dropping the coin. To get the points that you need, in the form of a precious gem, EXAMINE around the gargoyle's chambers.

Joey Staton
Kingstree, SC

CURSE OF THE MUMMY

Scoreboard:

I have solved *Sands of Egypt* up to the mummy's treasure. Does anyone know how to get the mummy's treasure out of that crack in the wall? If anyone would like to know how to get *to* the mummy's treasure, write to me at 1450 Picadilly St., 23513. Any donation would be appreciated. Address letters to "Computer Info" or to me. Please include a SASE.

Harry L. Perkins, III
Norfolk, VA

ADVENTURE TIME-OUT

Scoreboard:

Is there any way to save a game and continue *Raaka-Tu* and *Pyramid* later on? It would be a great help and there would be fewer occasions I'd have to leave my CoCo 2 on for weeks on end. Please write to me at 1715 Martin Ave., SE, 49507 or leave me a personal message on "Tom Mix" at (616) 956-9553 as "Booth II" or on "G.R.A.S.S. II" at (616) 791-2109 in CP/M.

Kenn Booth II
Grand Rapids, MI

KEY TO THE PYRAMID

Scoreboard:

I have finally solved *Pyramid* and, to whom it may concern, you must get the jewel encrusted key in order to open the sarcophagus. Also, the plant that's murmuring "water . . . water . . ." is in the bottom of the western two-pit room.

I need help in solving *Madness and the Minotaur*, and I've gotten to the wizard's image in *Dungeons of Daggorath*, but I just can't figure out how to kill it. Also, if anyone could help me in getting to level 4D in *Time Bandit*, I'd greatly appreciate it. If you can help me in any way, contact me at 582 Sharpners Pond Rd., 01845. If you need any help with anything, I'll be glad to help out.

Jeff Murphy
North Andover, MA

Scoreboard:

For everyone having trouble with *Dungeons of Daggorath*, here are some tips.

If you are having trouble incanting rings, look up the word for the kind of ring it is. [For example,] for the Vulcan ring you would look up [the meaing of] Vulcan and then type INCANT (blank); whatever the word in the blank is will have to do with Vulcan. Do the same way with the other rings. (Gold rings cannot be incanted.)

If you are still trying to defeat the wizard clone, spare all of your incanted rings. Four hits with them will kill the clone. Be sure to have the sword in one hand and the remainder of the incanted ring in the other. You will be transferred to the fourth level with only what is in your hands and the torch you're using.

To kill the real wizard, use the jeweled ring after it's incanted and the elvish sword. Do it in a "hit and run" manner. After the wizard's killed there is one more thing to do before you see "Behold! Destiny . . ."

Nathan Russell
Minco, OK

MITIGATION FOR MADNESS

Scoreboard:

I have managed to find some information for *Madness and the Minotaur*. It is a list of objects needed to pick up other spells, objects and to kill monsters. There is also a way to get out of the maze. To get this list send $2 (Canadian funds if possible) to P.O. Box 2914, T0A 2M0.

Larry Plaxton
Medley, Alberta

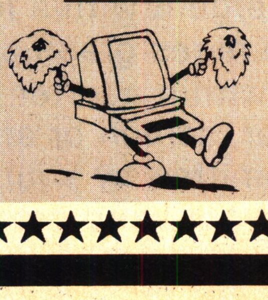
FOR SOLUTION SEEKERS

Scoreboard:

I'm an Adventure player and I've solved quite a few games. If anyone has any questions send a SASE to Route 1, Box 125, 38011. The following games are ones I have solved: *Raaka-Tu, Pyramid, Bedlam, Adventure Trilogy, Cimeeon Moon, Dungeons of Daggorath* and most of *Madness and the Minotaur* (I think I have all the treasures, but I've never gotten them all after killing the monsters, getting all the spells and opening one crypt).

Does anyone know where the potion is in *Raaka-Tu* and what it does? You don't need it to get 50 points.

Kevin A. Cullum
Brighton, TN



LOTS O' LASERS

Scoreboard:

I have played *Cavern Copter* (THE RAINBOW, Feb. '84) especially with the programming and I have a few tips for those that can't seem to beat the hordes and get the artifact. You can receive an infinite number of lasers by editing Line 752 and changing $F = F + 1$ in the third line of 752 to $F = F + 0$. This will give you as many lasers as you wish to use.

I can't seem to get the key in the electrical therapeutic room in *Bedlam*. If anyone can give me a few hints, write me at 64 Mt. Bethel Rd., 07060.

Scott Bishop
Warren, NJ

Scoreboard:

I own a TRS-80 CoCo 64K. Is there a game for my computer that has the same concept as *Dungeons and Dragons*? A game that rolls up characters and allows you to fight vicious monsters to acquire treasure? If not, is there a version about *Temple of Alpshai* for the CoCo? My address is 630 Crestview, 97467.

Todd Gieber
Reedsport, OR

Scoreboard:

I would like to know some ways to move the Hi-Res screen. I want to move it forward, like in *Pole Position* and *Turbo*; in a scrolling fashion, as in *Skramble*; and around with obstacles in a set position, as in *Battlezone*. Anyone with one or more answers, please send them to me at 604 Kings Cross Ct., 45449.

Garrett Butulis
Dayton, OH

PASSWORD TO FREEDOM

Scoreboard:

In the Adventure *Black Sanctum* if you are in a place where none of the commands work you just have to say INVOCARE EPISCOPUS and you'll be free.

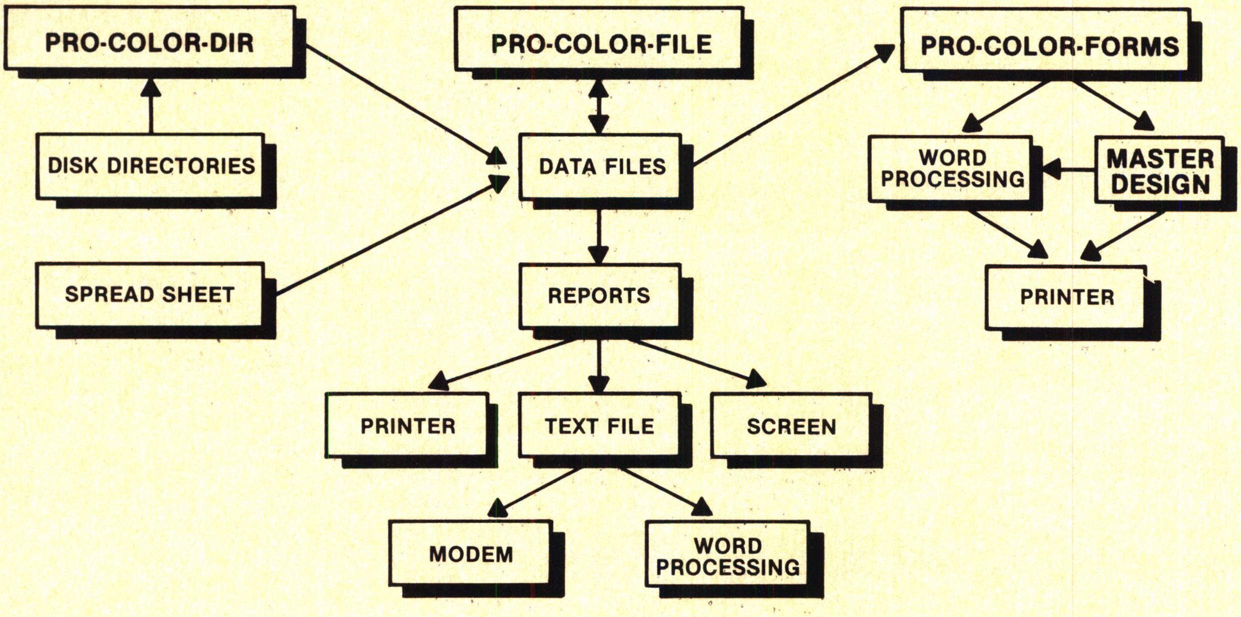
If you want to know parts or the whole solution to *Black Sanctum*, write to me at 8640 Hocheiaga, H1L 2M4.

Jean Michel Grenier
Montreal, Canada

TOTALLY INTEGRATED PACKAGE

After two years on the market, we've orchestrated our software to perform for you in ways other programs can't even play second fiddle to.

The all new ***Pro-Color-Series***™ offers total integration between its advanced database functions, word processing, spread sheet, graphics and communications.


PRO-COLOR-DIR
PRO-COLOR-FILE
PRO-COLOR-FORMS
DISK DIRECTORIES
DATA FILES
WORD PROCESSING
MASTER DESIGN
SPREAD SHEET
REPORTS
PRINTER
PRINTER
TEXT FILE
SCREEN
MODEM
WORD PROCESSING

PRO-COLOR-FILE will listen to your spread program and create data files that can be reported and sorted even further. **PRO-COLOR-FORMS** will take data from **PRO-COLOR-FILE** and merge it with a letter for bulk mailings. It will even merge hi-res graphics from **MASTER DESIGN** for placement within a letter or form. It will send reports to a printer, screen or an ASCII text file that can then be transmitted by your communications program or read by your word processor.

Pro-Color-Series™

© 1984 by Derringer Software, Inc.

Now there's a series of programs that offers integration between the five major uses of a computer — Database, Word Processing, Spread Sheet, Communications and Graphics!

PRO-COLOR FILE *Enhanced* 2.0 $59.95

An all new version of **PRO-COLOR-FILE** will once again leave its mark as the most flexible database in its price range for the Color Computer.

• 60 Data Fields • 1020 BYTE RECORDS • TRUE MULTI DRIVE SUPPORT • 4000+ RECORD CAPACITY • 4 USER DEFINED DATA ENTRY SCREENS • 28 MATH EQUATIONS • IF-THEN-ELSE FUNCTIONS IN EQUATIONS • FILE-WIDE RECALCULATION • 8 USER DEFINED REPORT FORMATS • 6 USER DEFINED LABEL FORMATS • TOTAL FIELDS ON REPORTS • SUMMARIZE FIELDS • SEND REPORTS TO PRINTER, SCREEN OR TEXT FILE • FAST ML SORT (750 RECORDS IN LESS THAN 5 MINUTES) • CREATE UP TO 16 INDEXES FOR SORTING OR REPORTING RECORDS • AUTO KEY REPEAT • KEYBOARD CLICK • STORES FORMATS FOR REPEATED USE • CUSTOM SELECTION MENUS • PASSWORD PROTECTION • CREATES FILES COMPATIBLE WITH DYNACALC® •

Because of **PRO-COLOR-FILES** ability to send reports to a text file, this means you can use your favorite communications program to transmit reports to other computers or read them in with your favorite word processor for creating customized reports. You can also convert ASCII files from your favorite spread sheet program into data files that can be accessed for further reporting and analyzing. **PRO-COLOR-FILE** is also supported by the **PRO-COLOR-FILE** National Users Group with quarterly newsletters. Join the rest of the world and discover for yourself what you've been missing.

PRO-COLOR-DIR $21.95

Need to organize all your diskettes so you know where each program is? **PRO-COLOR-DIR** will read your directories and create a master data file that can be accessed by **PRO-COLOR-FILE** for sorting and reporting. 1000 + records can be stored on one diskette with valuable information about each program.

• DISK ID NAME • FILENAME/EXT • TYPE OF FILE • DATE CREATED • DATE UPDATED • NUMBER OF GRANS ALLOCATED • NUMBER OF SECTORS ALLOCATED AND USED • MACHINE LANGUAGE ADDRESSES •

A diskettes directory can be re-stored in the data file with old entries deleted and new ones appended automatically. You can obtain hard copies of the information and create labels of the filenames for placing on the diskette itself.

MASTER DESIGN $29.95

This graphics program does more for you than just hi-res graphic editing. It will generate lettering in hi-res graphics that can be different sizes, skinny, bold, textured, drop shadowed, raise shadowed or tall. It will also interface with the Telewriter-64 word processor for printing hi-res displays with your letters.

As a graphics editor, it takes full advantage of all the extended BASIC hi-res graphic commands. Create boxes, circles, lines, copy displays and utilize GET and PUT features. Some added commands include mirror reflection, turn displays backwards or upside down, Squish displays, create dot patterns for shading or diagonal lines for creative backgrounds.

Special text files created with the Letter Head Utility allow you to access hi-res graphics from Telewriter-64, your own BASIC programs or **PRO-COLOR-FORMS.**

MASTER DESIGN comes with its own screen dump routine which interfaces with all popular dot matrix printers that have dot addressable graphic ability.

See reviews in:
July '84 *Rainbow*, Oct. '84 *Hot CoCo* Telewriter-64 © 1983 by Cognitec

PRO-COLOR-FORMS 2.0 $29.95

PRO-COLOR-FORMS will access data files you create with **PRO-COLOR-FILE** and merge them with a letter or place them on pre-printed forms such as statements. Any field of information from your data file can be placed anywhere and repeated as many times in the letter or on the form. You can use the built in ML text editor for creating the form or use your favorite word processor.

• DESIGN UP TO 6 FORMATS AT ONE TIME • USER DEFINED PAGE SIZE • SUPPORTS SPECIAL PRINTER CONTROL CODES • RIGHT JUSTIFICATION • PASSWORD PROTECTION • MERGES WITH GRAPHICS FROM MASTER DESIGN •

If you use our graphics program **MASTER DESIGN**, you can merge graphics with your forms for added enhancements. Have your graphic letter head printed at the top of each letter or incorporate designs, bar graphs or any display created within the form itself.

Buy any 3 and deduct 10% — Buy all 4 and deduct 15%

Shipping: Include $3.00 for UPS shipping, $6.00 postal, $12.00 overseas
Send orders to: Derringer Software, Inc. P.O. Box 5300, Florence, SC 29502-2300
VISA/MasterCard customers call: (803) 665-5676 10:00 am to 5:00 pm EDT

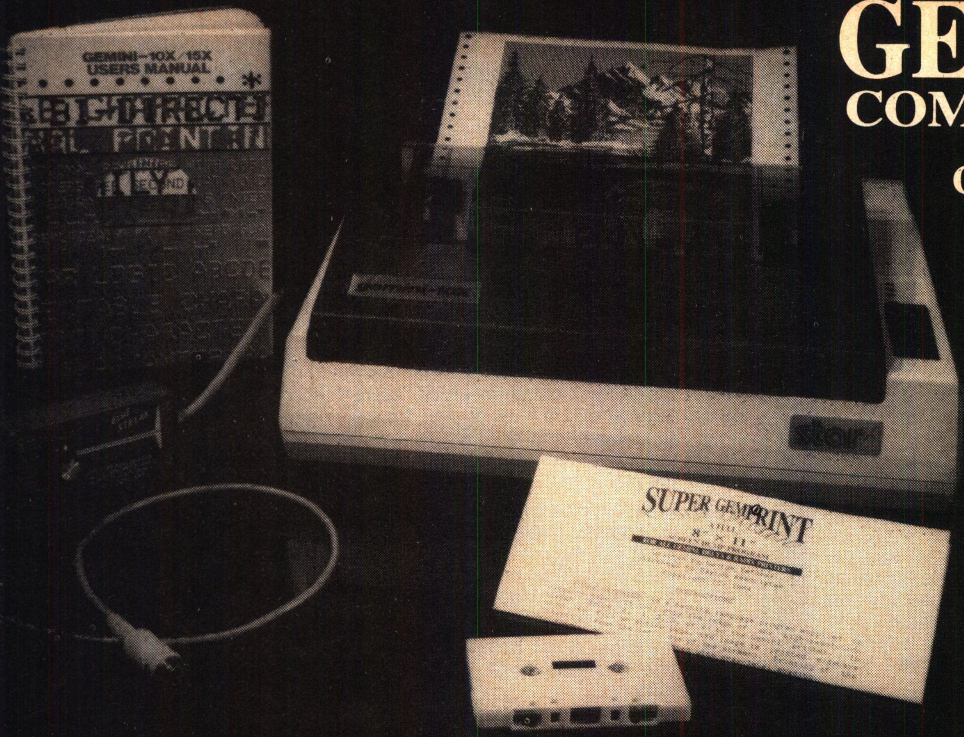
NEW

DYNACALC®

THE BEST SPREAD SHEET PROGRAM ON THE MARKET* $99.95 (Includes DYNAGRAPH©)
$89.95 IF PURCHASED WITH ANY OF THE ABOVE PROGRAMS.

DYNACALC® is a registered trademark of Computer Systems Center. DYNAGRAPH© is copyrighted by Derringer Software, Inc., 1984.
TELEWRITER-64© is copyrighted by Cognitec, 1983.

GEMINI 10X
COMPLETE SYSTEM



Gemini 10X

PRINT SPEED—120 cps. Bidirectional Logic Seeking

PRINT SIZE—10, 12, 17, 5, 6, 8.5 cpi

NUMBER OF COLUMNS—80, 96, 136, (40, 48, 68 in Double Wide)

CHARACTER MATRIX—9 x 9 Standard, with True Descenders • 18 x 9 Emphasized • 18 x 18 Double Strike • 6 x 6 Block Graphics • 60 x 72 Low Resolution, Bit Image Graphics • 120 x 144 Hi Resolution, Bit Image Graphics • 240 x 144 Ultra Hi Resolution, Bit Image Graphics

CHARACTER SETS—96 Standard ASCII Characters • 96 Italics • 64 Special Characters • 32 Block Graphic Characters • 96 Downloadable Characters • Super and Sub Script

LINE SPACING—Programmable by n/144"

PAPER HANDLING—Roll Paper • Cut Sheet • Tractor Fanfold • Copies: 3 Carbonless Sheets

ONE YEAR WARRANTY
Serviceable at over 4000
Locations Coast to Coast

THE BLUE STREAK
Serial to Parallel Interface

RAINBOW CERTIFICATION SEAL

SLEEK—½"x2"x4" Optional AC Supply plugs into side - AC not required with most printers

FAST—300 to 9600 Baud - 30% faster than the standard 9600 Baud Interface.

STRONG—Built sturdy with jacked cable, strain reliefs and highest quality components.

- Complete with ALL cables and connectors
- 180 Day Warranty

SUPER GEMPRINT
A Full 8x11 Screen Dump Program

- User definable color shading
- Prints all 5 Pmodes
- Machine language position independent code
- Tape transferrable to disk

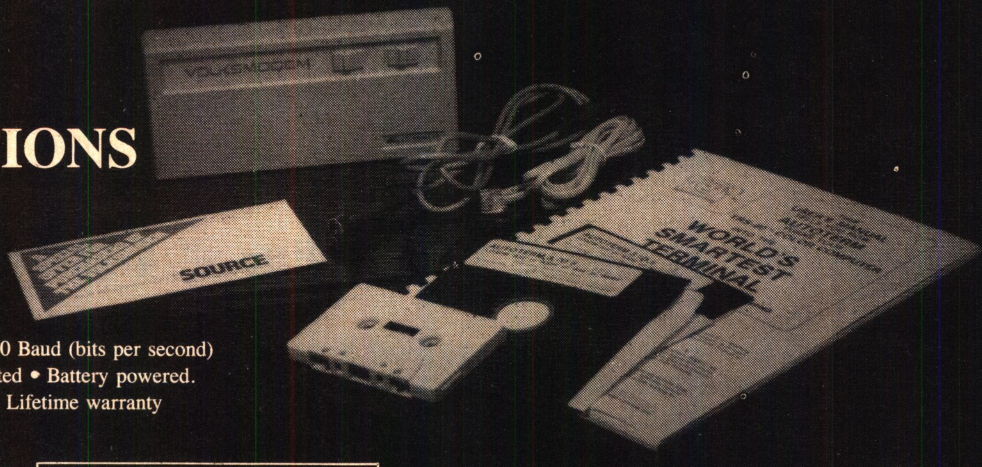
COMPLETE — NOTHING MORE TO BUY — *INCLUDES:*

- GEMINI 10 X PRINTER
- BLUE STREAK INTERFACE
- SUPER GEMPRINT
- DELUXE MANUAL

299.95 + $10 SHIPPING AND INSURANCE
15X SYSTEM 439.95

BLUE STREAK ALONE — 54.95 SPECIFY PRINTER

COMPLETE DATA COMMUNICATIONS PACKAGE



VOLKSMODEM™

Connects directly to wall phone jack
• Telephone jack with voice/data switch • 300 Baud (bits per second)
• Originate/answer mode automatically selected • Battery powered.
Low drain for long life (batteries included) • Lifetime warranty
• Includes all cables for COCO

AUTOTERM™ by PXE Computing

"Best of Class" - Randolf Graham Rainbow
Highest Ratings by Hot CoCo
"A Cut Above" - Wayne Day Color Computer

Includes subscription to THE SOURCE. Limited Time Offer May Not Be Available.

VOLKSMODEM *with Cables*	VOLKSMODEM AUTOTERM *(TAPE)*	VOLKSMODEM AUTOTERM *(DISK)*
69.95 + $2 S&I	99.95 + $2 S&I	104.95 + $2 S&I

DAYTON ASSOCIATES, INC.

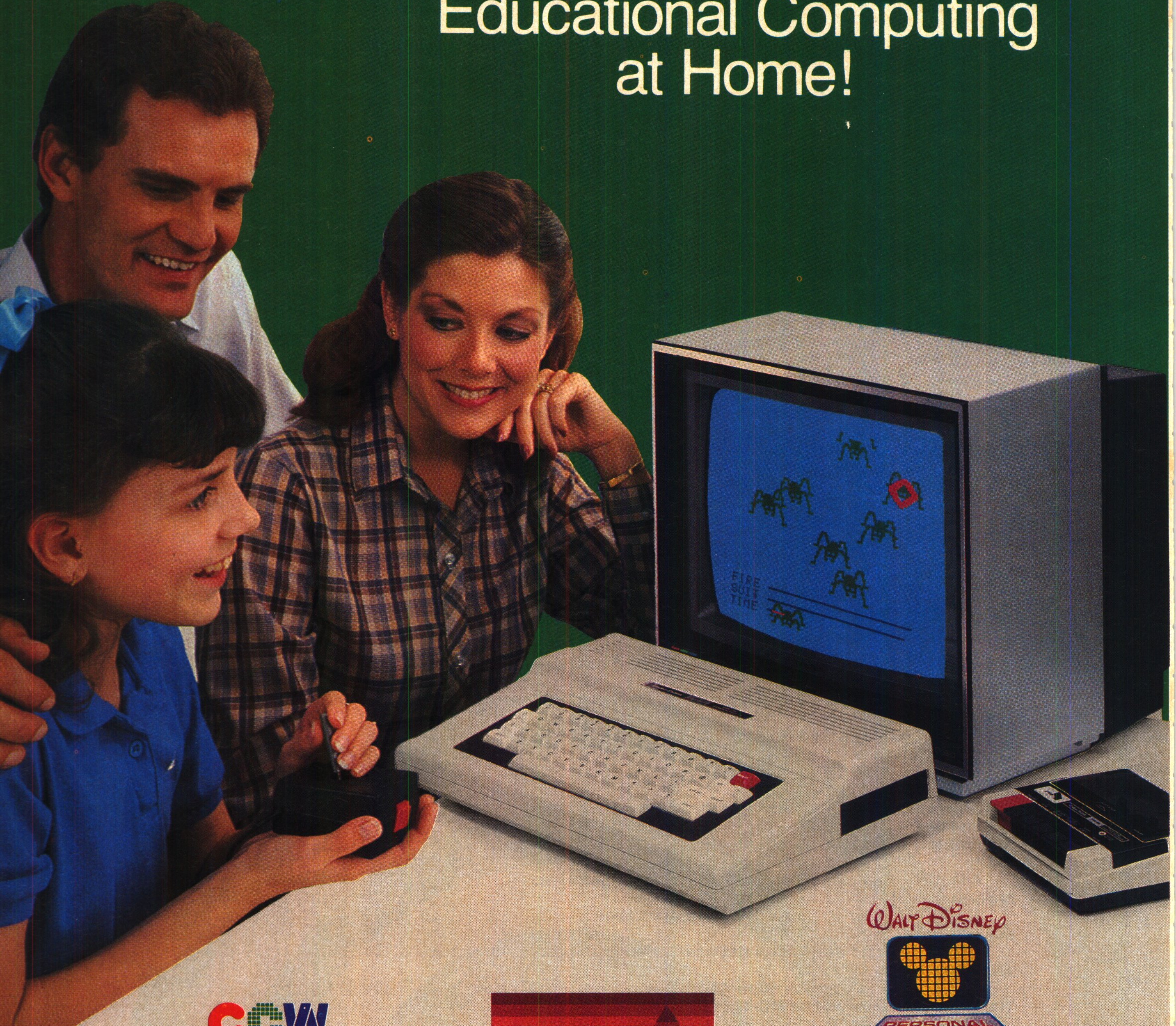
STAR AUTHORIZED DEALER • DUN & BRADSTREET LISTED
7201 CLAIRCREST BLDG. C • DAYTON, OHIO 45424
(513) 236-1454
OHIO RESIDENTS ADD 6% SALES TAX
C.O.D. ADD $2.00

RAINBOW REVIEWS

ADOS
Much Ado/*Spectrosystems* 211
Addition
An Educational Plus/*Wish Software* 216
Androne
A Fun Way To Zap Bugs/*Radio Shack* 219
Adventure Generator
Develop Your Own Adventure/*Spectrum Projects* 227
Assembler Language Programming Toolkit
A Powerful Debugger/*The CoCo Freeware Clearinghouse* 239
Blackjack Royale, Version 2.0
A Royal Blackjack Trainer/*Spectrum Projects* 217
Christmas Quiz
Excellent Religious Learning Tool/*Quality Christian Software* 223
Coins
An Educational Plus/*Wish Software* 216
Colorgrade
An Educational Application Program/*Computer Island* 230
Deputy Inspector
To Organize Your Disks/*Sonburst Software* 202
Dynamite+
A Powerful Disassembler/*Computer Systems Center* 195
Elite*File
For Fast, Flexible, Sophisticated Database Management/*Elite Software* 241
Final Countdown
Countdown To Fun/*JARB Software* 212
Freeform
A Flexible, Menu-Driven Database/*TMP Software* 198
GTRM
A Good Text Screen Enhancer/*Dugger's Growing Systems* 236
Graphic Compression Utility
Three Programs Rolled Into One/*L P Seymour Services* 218
Happy Birthday Mr. Gift
A Gift For Young Children/*Teksym Corporation* 226
Heroes and Trolls
A Maze Math Adventure/*Cognitive Development Co.* 215
Hide-A-BASIC
Protect Your BASIC Programs From Piracy/*Microcom Software* 200
Ice Hockey
Hockey Fans Will Love It/*Computerware* 244
In Assembly Language
A Must For Any Programmer/*Dataman International* 207
LOGO Starter
A Place to Begin/*B & B Software* 208
Middle Kingdom
A Fun, Monster-filled Adventure/*Computerware* 224
Musica 2
Creates Beautiful Music With Your CoCo/*Speech Systems* 225
Nomad
A Rolling Companion For CoCo/*Frank Hogg Laboratory* 213
Oki Dump
A Screen Print Utility/*Color Connection Software* 206
Pattipak
Eat Those Dots And Have Some Fun/*Petrocci Freelance Associates* 237
The Pond
Shapes And Sharpens Problem Solving Skills/*Sunburst Communications* 203
Quix
A Quick, Strategic, Top-Notch Game/*Tom Mix Software* 237
SP-2 Serial Interface
At A Good Price/*CNR Engineering* 222
Speed
Gives Good Unit Conversion Practice/*Shamrock Software* 214
Spelling Bee
Fly Away With Kay/*Crystal Software* 220
Stomp
A Fun Way To Stomp Your Opponent/*Cancoco Software* 196
Super Gemprint
For Printing Your Masterpiece/*Dayton Associates* 205
Super Spooler
Letting CoCo Do Two Things At Once/*Tandar Software* 219
TAXAID
Prepare Your Income Tax Form/*Alpha Byte* 221
TRS-80 Color Computer And MC-10 Programs
Develop Programming Skills/*Radio Shack* 238
Video Reverser
Is Easy To Install/*Dynamic Electronics* 221
Weight
Gives Good Unit Conversion Practice/*Shamrock Software* 214
Wizard
Gives CoCo More Character/*D.Dean Rector* 194

Enjoy Holiday Savings on All of Our Popular Color Computers

And Start Educational Computing at Home!



CCW
CHILDREN'S COMPUTER WORKSHOP
AN ACTIVITY OF
CHILDREN'S TELEVISION WORKSHOP

SPINNAKER™
We make learning fun.

WALT DISNEY
PERSONAL COMPUTER SOFTWARE

Put Radio Shack's exciting Color Computer 2 and the best in children's software under your tree this Christmas. You'll save money now and delight your family throughout the year!

The Perfect Gift at the Perfect Price

Now you can save up to $60 on the remarkable Color Computer 2 and enjoy home computing with your children anytime. Just attach the Color Computer 2 to your television set and Radio Shack's easy-to-understand instructions will have you and your children programming right away—even if you've never used a computer before. Or select from dozens of useful programs and colorful game packs to make the Color Computer 2 the perfect computer for everyone at home!

Choose the Model Right for Your Family

Radio Shack offers three affordable models of the Color Computer 2. The 16K Standard BASIC Color Computer 2 includes a typewriter-quality keyboard, compact styling and built-in BASIC language capability. BASIC is a versatile computer language your children may already have used in school. Now they can write their own programs and create spectacular eight-color graphics at home. And the 16K Standard Color Computer 2 is supported by a full line of quality Radio Shack accessories, so you can expand as your children's interest and skills grow.

The 16K Extended BASIC Color Computer 2 includes the features of the Standard Color Computer 2, plus advanced programming capabilities made possible by the Extended BASIC language. You'll be able to write more sophisticated programs and create high-resolution color graphics using simple one-line commands.

Color Computing for Advanced Programmers

The 64K Extended BASIC Color Computer 2 has the power and performance for advanced home and small-business use. The 64K Extended Color Computer 2 can easily see your children through high school, college and beyond, or stay at home with you to help out with investment analysis, home budgeting, business records and more. With the built-in Extended BASIC, your family can take advantage of 32K memory, enough for many advanced programs and computer games. Add an optional disk drive and operating system and your family can access 64K.

A Terrific Gift to Give or Get!

Take advantage of Radio Shack's special holiday savings on the Color Computer 2. It's a gift your children will use and enjoy, and a handy tool you can use at home or work.

Bring Home the Best in Educational Software

Your children will enjoy Radio Shack's selection of educational software as much as the Color Computer 2. You'll enjoy knowing they're using carefully prepared educational software from the names you can trust: Children's Computer Workshop (a division of CTW—the creators of Sesame Street™), Walt Disney and Spinnaker. Choose from programs to help improve reading, writing, math and science skills for children age 3 and older.

Start Home Computing This Christmas

Radio Shack makes it easy to start computing with your family. Just visit your nearest Radio Shack Computer Center, participating store or dealer for a demonstration of the exciting Color Computer 2 and accessories like printers, cassette recorders, joysticks—even disk drives. And don't forget the software!

16K Standard	16K Extended	64K Extended
99.95 26-3134 Reg. 119.95	139.95 26-3136 Reg. 159.95	199.95 26-3127 Reg. 259.95

Radio Shack CITILINE YOUR CARD CITIBANK

USE YOUR CITILINE

Radio Shack®

The Technology Store™

A DIVISION OF TANDY CORPORATION

Send me a 1985 Computer Catalog.

Mail To: Radio Shack, Dept. 85-A-345
300 One Tandy Center, Fort Worth, Texas 76102

NAME ____________________
ADDRESS ____________________
CITY ____________________
STATE __________ ZIP __________
PHONE ____________________

Prices apply at Radio Shack Computer Centers and at participating Radio Shack stores and dealers. Sale ends 12/31/84. TV, cassette recorder and joysticks sold separately. Walt Disney is a trademark of Walt Disney Productions. Spinnaker is a trademark of Spinnaker, Inc. Sesame Street is a trademark of Children's Television Workshop. All rights reserved.

RECEIVED & CERTIFIED

The following products recently have been received by THE RAINBOW, examined by our magazine staff and approved for the *Rainbow Seal of Certification*, your assurance that we have seen the product and have ascertained that it is what it purports to be. This month the *Seal of Certification* has been issued to:

Adventurus Supremus 4.6 B, a 16K Adventure game set within a medieval framework. Offerings of the standard props and goals are treated with a light, farcical touch. Bacchus Computer Software, 143 East Michigan Avenue, Paw Paw, MI 49079, cassette $9.95

ROM-Disk, a 64K disk utility enabling users to make backups of ROM packs by saving them on disk and running them from disks without removing the disk controller. B. Erickson Software, P.O. Box 11099, Chicago, IL 60611, cassette $25

Big B Pro Quarterback, a 16K simulation of football for one or two players or playing against the computer. Options include game speed, offensive ground or pass choices, and save game for interrupted competition. Big B Software, P.O. Box 91, Broomfield, CO 80020, cassette $16.95

AlphaTalk and **Countem,** two 16K ECB programs using colors, speech and music to teach the alphabet and numbers up to 10 to preschoolers. *AlphaTalk* and *Countem* were designed to allow speech using Spectrum Projects' *Voice Pak,* but it is not required for the programs to function. Color Connection Software, 1060 Buddlea Dr., Sandy, UT 84070, both cassettes $14.95 plus $2 S/H

Don't Forget, a 32K Personal Time Management System and Event Recorder with Memos requiring one disk drive. Users can record the entire year's occasions and daily appointments. Each day has spaces for four special occasions, two memos and hourly notes for 6 a.m. to 9 p.m. Display or print any daily or weekly schedule, and/or print blank monthly calendar pages for planning. Computerware, Box 668, 4403 Manchester Ave., Suite 102, Encinitas, CA 92024, disk $24.95 plus $2 S/H

Major Istar, a 32K Adventure-Simulation game with three arcade sequences requiring a joystick. Set in the 21st Century of undersea cities and interstellar spaceships, you as *Major Istar* must answer a mysterious distress call from the Trident Research Dome. Computerware, Box 668, 4403 Manchester Ave., Suite 102, Encinitas, CA 92024, cassette $24.95, disk $27.95 plus $2 S/H

Sam Sleuth, a 64K graphics Simulation-Adventure game requiring a mouse or joystick. As detective *Sam Sleuth* you are given three cases of increasing difficulty testing your investigative and strategy skills. Elements change with every game. Computerware, Box 668, 4403 Manchester Ave., Suite 102, Encinitas, CA 92024, cassette $24.95, disk $27.95 plus $2 S/H

The DATA'PHILE Pause Control, a device to put any task the computer is performing on hold (except cassette operations) with the flip of a switch. Capabilities include: pause of play during games, directory listings on disk systems, program execution for debugging and functions for Computer Security. The DATA'PHILE, 207 Melrose Dr., North Syracuse, NY 13212, $19.95

Disk Sort and Order, a 32K disk utility compatible with Disk BASIC and JDOS to implement disk library organization. Directories are sorted alphabetically with killed filenames deleted, and disks are restructured so that all grans for each file are sequenced. Derby City Software, 3141 Doreen Way, Louisville, KY 40220, disk $11.95

Rembrandt, a 32K graphics utility requiring joysticks and utilizing Hi-Res *PMODE 4* screens with artifact colors. Features include: Line drawing, circles, ellipses, painting in 16 patterns, enlarge/edit mode, text on graphics screen, save, load, six sample pictures included and four different text fonts. Family Computers, 4047 Bee Ridge Rd., Sarasota, FL 33582, cassette $24.95, disk $27.95

Castle Ragoona, a 16K Adventure featuring Hi-Res graphics, sound and music. The Adventurer must take over the castle by navigating through mysterious passageways and by vanquishing monsters. Family Computers, 4047 Bee Ridge Rd., Sarasota, FL 33582, cassette $24.95

Grafx, a 32K monthly graphics disk featuring hit songs, amusing pictures and themes relating to the special events of the month. GRAFX, P.O. Box 254, West Mifflin, PA 15122-0254, one year's subscription, 12 disks $99.95, sample disk $13.95

SHRINX, a 32K disk utility that functions as an addition to *Graphicom.* Features include: load or write to binary pix file, reduce or enlarge any graphics picture and one to four drives with directory of any drive. GRAFX, P.O. Box 254, West Mifflin, PA 15122-0254, disk $29.95

Grand Prix, a 32K racing game in Hi-Res graphics with sound effects. Joystick or keyboard input. Joystick input is compatible with all joysticks. INTRACOLOR, P.O. Box 1035, East Lansing, MI 48823, cassette $34.95, disk $34.95

TREKBOER, a 32K Hi-Res Adventure game. The scenario: Life on earth is threatened by a deadly virus and you must search the frontiers of space and return with a cure to save humankind from disaster. But how? Where? With what? Mark Data Products, 24001 Alicia Pkwy., No. 207, Mission Viejo, CA 92691, cassette $24.95, disk $27.95

Omega File, a 32-64K database filing system requiring one disk drive. Operations performed are: add, see, change, delete, sort, directory and print. The system can handle up to 16 fields of 255 characters per field. Printouts can be formatted to print on either an 80-column or a 132-column printer. The Other Guy's Software, 875 South Main, Logan, UT 84321, disk $14.95 plus $2.50 S/H

Color-Stat Strategy Baseball Game, a 32K Disk Extended BASIC strategy game that allows you to choose and manage a baseball team. Included are database programs to compile, change, utilize in play and printout any teams or leagues you wish to form. Pinto Products, 718 Fiji Circle, Santa Ana, CA 92704, disk $27.95 plus $2.50 S/H

Downland, a 16K maze requiring a joystick. A speleologist's nightmare: the rocks slide and cut off the exit. There's no turning back, but you brazen it out and discover diamonds, bags of gold and magical keys while dodging dripping acid, falling boulders and a poisonous bat. Radio Shack stores nationwide, $24.95

TRSCOPY, an OS-9 utility that transfers text files from either Disk BASIC to OS-9 or from OS-9 to Disk BASIC, but runs only under OS-9's operating system. You may transfer both text files and programs saved as ASCII files from one operating system to the other. However, *TRSCOPY* moves files without modification; control and other special characters are copied, but not translated. Radio Shack stores nationwide, $24.95

T/S EDIT, a CoCo program/text editor featuring full screen editing, true lowercase letters, side scrolling, variable character display, global editing and multiple file merging. *T/S EDIT* may be used with either Disk

BASIC (minimum requirement of 32K RAM and one disk drive), or OS-9 (minimum requirement of 64K RAM and one disk drive). Radio Shack stores nationwide, $34.95

FILE TWO, a 32-64K ECB database management program. Operations include: search, sort, alphanumeric sort and printout. West Bay Company, Route 1, Box 666, White Stone, VA 22578, cassette $20

Library I, a system library for Color Disk EDTASM users requiring disk drive(s). Capabilities include: building DCBs, open, close, read and write DOS files; open, close, read and write ASCII tape files; input keyboard data, move data in memory, clear memory, print, sound and clear screen to any of nine colors. Uses single line commands. Sadare Software, P.O. Box 3891, Gaithersburg, MD 20878, disk $24.95

Data Line Switch Box, an RS-232 switching device to use your modem and printer without having to unplug one to use the other. Phelan Enterprises, distributed by SOFTMART, 5024E Departure Dr., Raleigh, NC 27604, $39.95

DEJAVU, a 32K ECB mix and match game with three to 66 matches possible. Hi-Res graphics will tax your memory as you control the size of the playing field. BearGrip Software, distributed by SOFTMART, 5024E Departure Dr., Raleigh, NC 27604, cassette $19.95, disk $22.95

SALVAGE, a program to salvage I/O Error disks for use again by locking out bad granules. Proper Programs, distributed by SOFTMART, 5024E Departure Dr., Raleigh, NC 27604, cassette $15.95

Yachtsee, a 32K ECB version of the board game Yahtzee for one to four players. The screen shows scores and keeps tally for all players and scores for six previous games. BearGrip Software, distributed by SOFTMART, 5024E Departure Dr., Raleigh, NC 27604, cassette $17.95, disk $19.95

CoCo Checker, a 16K diagnostic program to test your CoCo and its peripherals for problems. Features include tests of: ROM, RAM, disk drives, controller, printer, keyboard, cassette recorder, joysticks, sound, PIA, VDG and internal clock speed. Spectrum Projects, P.O. Box 9866, San Jose, CA 95157-0866 or P.O. Box 21272, Woodhaven, NY 11421, cassette/disk $19.95 plus $3 S/H

Convert Complex, a 16K ECB disk programming utility that converts the numerical systems decimal, hexadecimal, ASCII, Octal, and binary into the user's choice and requires two disk drives. Also included are the programming aids *Computer Memory* and *Language Analyzer.* TITAN Software, 508 West Avenue, Northvale, NJ 07647, disk $38 plus $4 S/H

The Ideal Host and **Teleremote Executive,** a 32K ECB communication complex requiring two disk drives. Capabilities include conversion of any 16K (and up) computer to a remotely operated mainframe computer. It can be accessed and operated by either smart or dumb terminals and has a two- or optional three-way security check. TITAN Software, 508 West Avenue, Northvale, NJ 07647, disk $148

Handler Complex, a 32K ECB disk utility that contains 1) disk handler for backup, solo copying or selective backup; 2) file handler for bilateral communication, private or non-private message preparation, BASIC to ASCII conversion and/or printout; 3) Mini-Editor for load, edit, save and type. TITAN Software, 508 West Avenue, Northvale, NJ 07647, disk $48 plus $4 S/H

The *Seal of Certification* program is open to all manufacturers of products for the TRS-80 Color Computer, the TDP-100, or the Dragon-32, regardless of whether they advertise in THE RAINBOW. By awarding a *Seal*, the magazine certifies the program *does exist*, but this *does not* constitute any guarantee of satisfaction. As soon as possible, these hardware or software items will be forwarded to THE RAINBOW's reviewers for evaluation.

— Monica Dorth

TAXAN . . . MONITORS OF CHOICE
(based on specifications and visual quality)

Definitions:

Screen Pixels: The most common measure of resolution (HxV).

Characters per screen: The maximum number of characters recommended to place into the display area. Monochrome monitors are recommended for word processing (80 characters × 24 lines).

Bandwidth: The speed at which a monitor can accept data from the computer. Video bandwidth constrains the screen refresh rate, active display area, pixel resolution, and image sharpness. Higher bandwidths allow steadier, sharper, more detailed images.

Dot pitch: The distance between the holes in a monitor's shadow mask. A smaller dot pitch produces closer pixels, higher resolution, improved character quality, and finer graphic detail.

computer plus TO YOU ...

TAXAN COLOR 210

Model #	Color 210	Color 220	Green	Amber
Price	$245	$245	$125	$129
Screen Size	12″	13″	12″	12″
Screen Pixels	380H	500V	1000H	1000H
Characters Per Screen	1000	1000	2000	2000
Bandwidth	6 MGz	6 + MGz	20 MGz	20 MGz
Dot Pitch	.63	.67	NS	NS

ONLY $245

CALL TOLL FREE 1-800-343-8124
(SEE OUR FULL PAGE AD ON PAGE 3)

REVIEWING REVIEWS

DAPPER

Editor:

We would like to congratulate Donald D. Dollberg on his excellent review of our disk zap program, *Dapper*. The review, which appears on Page 212 of the October RAINBOW, is highly accurate. Normally even a very favorable review has some error or misunderstanding. In our review of Mr. Dollberg's review, we could find no errors.

The version of *Dapper*, reviewed by Mr. Dollberg, was the very first release of that program. A new, improved version of *Dapper* has been released. The latest version of *Dapper* has three additional commands. These are *HIDE, SEEK* and *SORT. HIDE* makes a copy of the allocation table and the directory. If the information in track 17 is destroyed or becomes unreadable, it can be retrieved from hiding by using the *SEEK* command. The last new command, *SORT*, sorts the directory.

In all, *Dapper* now has 14 commands. They are:

BACKUP — backs up a disk to tape
CERTIFY — certifies disk granules
DIRECTORY — lists the directory
DUMP — prints a sector in ASCII and Hex
END — exits the program
HELP — displays commands information
HIDE — copies track 17
MAP — maps the granules of files
MOVE — moves a granule
RESTORE — restores a disk from tape
SEEK — retrieves track 17 from hiding
SORT — sorts the directory
VERIFY — verifies the granules of files
ZAP — enters the zap subsystem

The cost of *Dapper*, however, remains the same. It is still $14.95.

The review may have left the impression that the "wild card" option for filenames only applies to the DIRECTORY command. In fact, this feature may be used on any command which accepts filenames, i.e., DIRECTORY, MAP and VERIFY. Additionally, the impression may have been left that only DIRECTORY could be abbreviated to three characters. In fact, all commands can be entered with three characters.

We are obviously pleased with such praise as "a little gem," "performed flawlessly" and "excellent supporting documentation." We were gratified that Mr. Dollberg would "highly recommend *Dapper*."

Thank you for your excellent publication, and for the quality reviews.

Craig Hunt
Sadare Software

TAXAID

Editor:

[In reference to Alpha Byte's *TAXAID* review] I have not at this point checked, but I am sure that Mr. Odlin is correct that there are some incorrectly spelled words in the program. Somehow this does not distress me, I do not lay claim to being a speller or a typist. However, with the help of "Mr. Webster," I can probably get most of these corrected before the release date of Jan. 1.

I think it is unfortunate Mr. Odlin tries to impose his views of what is aesthetically pleasing on paper and screen, and thereby he does a disservice to your readers in limiting his review to trivia rather than what the program does with the 280 variables used more than 1100 times.

When was the last time Mr. Odlin completed a 1040 with several schedules? If within recent times, I believe his conception of *slow* would be more than somewhat changed. It runs faster than a trip to those well-known brothers who do one's taxes for a considerable fee.

John M. Gregg
Alpha Byte

Editor:

Alpha Byte's program is slow, awkward and incomplete. Programs displaying the opposite qualities exist in abundance, for other operating systems, and unless one desires to maintain CoCo in a sort of "ghetto," there is no need to pretend things like *TAXAID* are adequate equivalents for such programs.

As for his attempts to pick fault with my prose, they would be altogether beside the point, even were they based on something more serious than personal annoyance and an inclination to thumb through obsolete grammatical texts in search of tomatoes to throw.

R. W. Odlin

ALDARON

Editor:

I just received a copy of [Dale Shell's] review of our *Aldaron* game (October 1984). I want to thank [Mr. Shell] and the other RAINBOW reviewers for the great job they've been doing. The review was fair and honest, and it's evident [Mr. Shell] spent quite a bit of time playing the game and giving it [his] serious attention.

I should mention that a slightly enhanced disk version is now available. The response from our customers on this game has been overwhelming; it seems people appreciate the 180-plus word vocabulary, and the intelligent, detailed descriptions. A sequel is being planned (the further adventures of . . .), incorporating customer suggestions. We intentionally make it difficult to complete our games — otherwise only novices would enjoy it and no one would want to play it twice. One can solve one of our Adventures, play it again, and discover dozens of new rooms in the process.

For you and anyone else who might be stumped by *Aldaron*, here are two hints: 1) Don't forget about the back door; and 2) if you translate the Latin into English, you'll discover it's a magic phrase (and incidentally, a quote from Shakespeare). Good luck, and thanks again.

Jeffry Dwight
Jade Products

Elite Software

NOW AT:

Radio Shack®

Available Via Express Order

If you're looking for Application Software that's...

• COLOR COMPUTER WORD PROCESSOR •

Elite·Word™

Also Available On OS-9

★ COLOR COMPUTER DICTIONARY ★

Elite·Spel™

• COLOR COMPUTER WORKSHEET •

Elite·Calc™

• COLOR COMPUTER DATA BASE MANAGER •

Elite·File™

- Easy to use.
- Has powerful features.
- Gets the job done FAST.

Elite Software does it All!!!

All of our Software Features:

★ Superior Ease of Use

★ Cross-file Compatability

★ Printer Compatability

★ Comprehensive Manual

★ Nationwide User-group Support

★ Handsome Vinyl Binder

★ Revision Upgrade Program

with
FREE
Mail Merge

* COLOR COMPUTER WORD PROCESSOR *

Elite•Word™

Also Available On OS-9

THE SECOND GENERATION WORD PROCESSOR IS HERE! ELITE•WORD is a high performance, all machine language, Full Screen Editor which offers an ease-of-use that is simply incredible. ELITE•WORD has many powerful features not found in other word processors for the Color Computer. ELITE•WORD also offers a printed output flexibility that can handle your sophisticated home and business applications.

LOOK at these features:

Very easy to use • Top screen line reserved for HELP display/Command prompts • Excellent for BOTH program editing and word processing • TWO text entry modes; Insert or Exchange • Auto Key-Repeat • Smooth display scroll for easier proof reading • True Upper/Lower case display with lower case descenders • Hi-Res text "View" mode displays text exactly as it will be printed; including text Justification, Auto Line Centering, dynamic Margin changes, Top and Bottom Margins, Page Numbering, and Page Breaks • Include feature (disk only) permits including several file names within one output document; total document will have sequential page numbering if desired • Fast Disk I/O; no loading of overlay files to slow down operation • Variable Text (Mail Merge) capability for Form Letter generation included FREE!

32K Extended Basic Required for ROM routine calls • Variable TAB stops • User definable Headers and Footers • Smooth cursor movement over text; in any direction (including vertical) • Page Forward or Backward through text • Jump to beginning or end of text • Automatic text centering • Automatic text Word-Wrap if desired • True Block text Move, Delete, or Copy • Delete entire screen line • Backspace and Delete Character • Delete character above cursor • Find a string of characters • Global Replace character string • Two Hi-Res screen displays; 32 x 19 for text entry/editing, 64 x 19 for formatted text viewing • Continuous Memory display • Over 22K file size in 64K machines • Easy generation of ASCII files • Save/Load text files (in ASCII if desired) • Program remembers last File Name loaded or saved, and will write to it by default if desired • All I/O errors trapped and recoverable • Disk commands for Change Drive, Directory and Free Space • Print Format features allow user to specify Left Margin, Line Length, Line Spacing, Top and Bottom Margin, Duplicate Copies, Right-Side text Justification, Page Pause, Page Numbering, and more • Dynamically change any print Format features within text • Imbed Hex codes and printer Font changes within text.

Additional OS-9 version features:
Edit two files simultaneously • Save or Print only a portion of the text buffer • Edit files larger than memory (uses disk as buffer) • Block Copy from one file to another • Execute any OS-9 command from Editor

If you want powerful features AND a program that's EASY TO USE, Elite•Word is for you . . .

Elite-Word TAPE RS#90-0183
Elite-Word DISK RS#90-0184
Elite-Word/OS-9 RS#90-0186

THE BEST FOR ONLY
Specify Tape $ 69.95
RS Disk $ 69.95
OS-9 Disk $ 79.95
OS-9 & RS Disk $115.95

"Elite•Word is a terrific word processor with an impressive list of features, yet it's easy to learn and use."
—Stuart Hawkinson, HOT COCO

"I was more than satisfied with Elite•Word . . . After the review, I would not hesitate to compare it with the two best selling word processors. And my comparison places it at the top of the list."
—A. Buddy Hogan, RAINBOW

★ COLOR COMPUTER DICTIONARY ★

NEW

Elite•Spel™

This program can't spell AARDVARK or SALUBRIOUS or VICHYSSOISE, but it is very easy to use and it's FAST! All potentially misspelled words are identified in a single pass through its 24,000 word dictionary. ELITE•SPEL is fully compatible with ELITE•WORD and will work with ASCII files from other programs. By the way, if you often use the word AARDVARK, ELITE•SPEL can learn it and up to 4,000 other words that are in your common vocabulary. Dictionary maintenance for adding and deleting words is included as an integral part of the program, not as separate programs. If speed is what you're looking for, Elite•Spel has it.

MAJOR features include:
Easy to use, menu commands • Single pass dictionary search • 1,000 word memory dictionary of common words • 20,000 word dictionary included • Room for 4,000 of your own words • List suspect words on screen or printer • List all words used with number of occurrences • Learn individual words that were correct in file • Learn entire files of words • Delete words from dictionary • Apply corrections to file in batch or interactive modes • Works in single or multiple drive systems • All machine language for maximum speed • 32K disk required.

Radio Shack® Catalog #90-0185

***Available on Disk only* $29.95**

When purchased with ELITE•WORD . . . ONLY $15.00

Elite Software

Productive Programs for Serious Users

All software features:

★ Superior Ease of Use
★ Powerful Features
★ FAST Program Performance
★ Cross-file Compatability
★ Printer Compatability
★ Comprehensive Manual
★ Nationwide User-group Support
★ Handsome Vinyl Binder
★ Revision Upgrade Program

MasterCard VISA

• Shipping from stock NOW •

Add $3.00 shipping and handling
PA Residents add 6% Sales Tax
OS-9 is a trademark of Microware and Motorola.
Dealer Inquiries Invited
Box 11224 • Pittsburgh, PA 15238 • (412) 795-8492

★ COLOR COMPUTER DATA-BASE MANAGER ★

Elite•File™

THIS IS IT! ELITE•FILE is the Data Base Manager that Color Computer users have been waiting for. ELITE•FILE is for everyone who needs to store and retrieve information. ELITE•FILE is a full-featured relational Data Base Manager with all the editing and report formatting features that are typically found on much larger computer systems. COMPARE the others for record structure flexibility, total record capacity, information processing ability, speed of program response, printed output flexibility, and you'll agree that ELITE•FILE may very well be the most powerful/useful program ever written for the Color Computer.

No other File Manager gives you these features: All machine language for speed • Flexible, user defined, data record structures • Up to 255 characters per record field • Up to 255 fields per record • Up to 2000 characters per record • Up to 4000 records per file • Up to 16 files can be open at the same time for information processing • Edit, Scan, Sort, Select Record information; all done FAST • Output reports to Screen, Printer, or ASCII Disk file • Place output data by Field Name, with Custom Text anywhere on the printed page • Perform math operations (+, −, *, /) between Field contents • Produce tabulated reports from multiple record contents • Generate column totals across record field contents.

Compatible with Elite•Calc and Elite•Word files • User friendly combination of Menu driven input, and single key commands • Supports up to 4 drives • Minimum 32K RAM, Disk required • Nested sub-field definitions • Up to 8 fields in Primary Key • Copy record definition from file to file • View/Print record definition • Input/Add records with easy to use field name format display • Edit records with full screen "type over" editor • Copy records to repeat identical data • Load Elite•Calc worksheets into random access data files • Scan mode for quick data retrieval • Locate any record by field contents • Select specific groups of records by field content with full logic combination capabilities • Sort records in ascending or descending order by any field, or group of fields • Calculate values from combinations of field contents • Output any subset of fields in any order for printed reports • User setable print formats; Page Title, Top and Bottom Margin, Line Spacing, Page Length, Page Pause, Form Feeds and more • Output format also supports TAB, VTAB, CR, PAGE, text, HEX printer controls, and more • Join up to four sub-files to extend data record for printing • Produce detailed repetitive reports, for output on preprinted forms, using output formats written on Elite•Word • Variable Text Insert feature of Elite•Word is fully supported • Refile old record data into NEW record structures • Data, Field Definitions, Indices all stored on a single file • Memory resident, no program overlays from disk • Single program performs all features • List disk Directories and "Kill" files without leaving the program • Data files also accessible from BASIC programs.

Radio Shack® catalog # 90-0189

COMPARE features and performance speed ... you'll agree that Elite•File is the one to buy.

THE BEST
FOR ONLY
$74.50
Disk Only

Elite Software

NOW AT **Radio Shack** STORES

Available via Express Order

Radio Shack is a trademark of Tandy Corporation

Available with Calc-List

★ COLOR COMPUTER WORKSHEET ★

Elite•Calc™

ELITE•CALC was the first Color Computer spreadsheet program offering "major league" features. All the magazine reviewers loved it! Today, when you consider program performance speed, ease of use, price, and total features . . . ELITE•CALC is still your best choice.

MAJOR features include: Very EASY to use • FAST Sorting • Printed Output, Screen Re-write, and Calculations all done FAST • Full cell-edit capability • Powerful cell-format options • Individual cell formulas • FREE sample worksheets • CALC-LIST availability.

Single character commands • Help displays • 255 maximum rows • 255 maximum columns • Available memory always displayed • Rapid Entry modes for text and data • Selectable, automatic, cursor movement • Insert, Delete, Move entire rows or columns • Replicate one cell to fill a row or column with selectable formula adjustment • All machine language for speed • Extended BASIC required for ROM routine calls • Automatic memory size detection for 16K, 32K, or 64K • >20K bytes storage available in 32K systems • Math operators: +, −, x, /, ↑, (,) • Relation operators: =, >, <, <=, >=, <> • Logic Operations: AND, OR, NOT • Conditional Formula: IF, THEN, ELSE • Trig Functions: SIN, COS, TAN, ATN • Log Functions: LOG, EXP, SQR • Misc. Functions: INT, FX, ABS, SGN, RND • Range Functions: SUM, AVERAGE, COUNT, MIN, MAX, LOOKUP • Definable constant table • User definable printer set-up commands • Individual column width settings • Adjustable row height to insert blank lines without wasting memory • Hide columns or rows • Alternate print font selectable on a cell by cell basis • Display/Print formats set by cell, row, or column • Dollar format, comma grouping, prefix or postfix sign • Scientific notation, fixed point and interger formats • Left and Right cell contents justification • Full page formatting • All formats stored with worksheet on disk (tape) • Save/Load Disk (tape) files in compact memory form • Scan disk directories • Output ASCII file for word processor input capability • Memory resident code . . . no repeated disk calls.

CALC-LIST is a separate, machine language, utility that works independently of Elite•Calc. It can read either tape or disk worksheet files, and will give you additional information that was previously "hidden" within your worksheet. With CALC-LIST, you can list on the screen (or print) the actual contents of your worksheet cells, including FORMULAS. You get all the valuable worksheet format data including assigned Column Widths, all cell Format specifications ($, C, I, F#, G, etc.), Constant table assignments, and Printer Format information (Set-up, Page Length, Line Width, etc.). Use your CALC-LIST printout as a hardcopy backup of your worksheet for review or archival purposes. You can even let your friends use the listing so they can type your worksheets.

Elite•Calc TAPE
RS catalog #90-0187
Elite•Calc DISK
RS catalog #90-0188

Specify Tape or Disk

Elite•Calc	$69.95
Calc-List	$24.95
Elite•Calc and Calc-List	$79.95

> *"Elite•Calc is a great spreadsheet program! This professional quality program has the performance required for serious home applications as well as small businesses."*
> —*Stuart Hawkinson, RAINBOW*
>
> *"Truly one of the best programs I have seen."*
> —*John Steiner, MICRO*
>
> *"Elite•Calc is an extremely powerful worksheet . . ."*
> —*Jack Lane, COLOR MICRO JOURNAL*
>
> *"Bruce Cook's Elite•Calc is a very fine program indeed; potentially one of the great Color Computer Programs." ". . . a very impressive product."*
> —*Scott L. Norman, HOT COCO*

Software Review

Wizard Gives CoCo More Character

Among CoCo's serious word-processor users, *Telewriter-64* is without a doubt, one of the easiest, most efficient and most flexible programs on the market for any computer. Two years after it was introduced, *Telewriter-64* remains an almost indispensable tool for many serious writers and programmers.

The only flaw, which really hasn't bothered most of us, has been the lack of a true on-screen, upper- and lowercase display with descenders.

Enter D. Dean Rector, of Knoxville, Tenn., who felt that it was time to give *Telewriter* a "little more character" when he found the screen difficult to read for long periods of time. Dean is one of those CoCo users who cannot resist delving into a program when they believe something can be improved.

Thanks to Dean's efforts, it is now possible for you to have a new on-screen font, plus real descenders for *Telewriter-64*. And as one who currently is typing this review using Dean's new *Wizard* program, I can attest to the relief that innovation offers the eyes after long periods of keyboarding. People who proofread for their livelihood will find *Wizard* especially helpful.

The program, which you can easily adapt to your existing cassette or disk copy of *Telewriter-64*, also includes option carriage return marks, which are very useful for locating run-on spaces at the end of lines and between lines. They allow you to count spaces between text lines and they are essential for reformatting non-standard text such as columns, tables and poetry. They're also useful if you write programs, in which a misplaced carriage return can spell disaster.

Complete instructions for modifying your existing *Telewriter-64* programs are spelled out in detail in 14 pages of documentation that are included with your purchase of *Wizard*.

Folks who are easily confused by terminology of programmers will be relieved to know that you do not have to worry with 'aren't we clever' explanations that leave you wondering whether you will ever get the program to work for you. The author tells you step-by-step in easy-to-understand directions what you need to do. You will experience problems only if you try to skip over the directions like this writer in his hurry to make the modification.

As far as I could determine, *Wizard* did not affect any other aspects of my existing program. Although the author warns that "occasionally there will be a printer that does not respond to *Telewriter-64* line feeds." I use an Epson RX-80 F/T and did not experience any problems. Suggestions are included should you run into difficulty, plus there's a 30-day return policy that enables you to return the program and receive a cash refund for the full purchase price.

Wizard is another CoCo winner, proving that we, as a user group, will not settle for less than the best in getting the full potential out of our favorite computer. I know you will appreciate these innovative enhancements to *Telewriter-64*.

(D. Dean Rector, 2601 Bridalwood Drive #4, Knoxville, TN 37917, tape $16.95)

— Charles Springer

DATEBOOK & CALENDAR

«»Tape or Disk files
«»Index records by date, month, year, or day
«»Prints date-to-date
«»Encryption by password, password is not stored

32k ECB $25.95

RELATIONAL DATABASE

Blistering fast sort, 1000 records in 10 sec OR LESS!
«»Multikey sort
«»Tape or Disk files
«»Math ability

SASE for more info

32k ECB $39.95

Butterfly Software
Rt 7 Box 565-A
Lubbock, Tx 79401
(806) 762-1941

One-Liner Contest Winner . . .

Using your right joystick, put the worm into the rotating ball located in the center of the screen. If you touch the ball, you will go back to the beginning of the game (your arrow will be placed in the upper-left corner of the screen). Type in and *RUN*.

The listing:

```
0 PCLS:FORA=0TO1:J=JOYSTK(A):M=8
-A*2:U=31*M:C(A)=C(A)-M*(J>60)+M
*(J<3)+M*(C(A)>U)-M*(C(A)<M):CIR
CLE(128,96),13+4*A,1,1,S,E:NEXT:
X=C(0):Y=C(1):IFPPOINT(X,Y)THENR
UNELSELINE-(X,Y),PSET:CIRCLE(X,Y
),3:SCREEN1,1:S=S+1/8+(S>1):E=S-
1/8:IFNOT(X=128ANDY=96)GOTO
```

Jeff Harvey
Dartmouth, Nova Scotia

(For this winning one-liner contest entry, the author has been sent copies of both *The Rainbow Book Of Adventures* and its companion *Rainbow Adventure Tape*.)

Dynamite + Is A Powerful Disassembler

By Dale L. Puckett
and
Bruce N. Warner

If you've ever disassembled a machine language program, you know the frustration of trying to make sense out of the listings of dozens of labels and system calls that went into the assembly source code listing. You can spend weeks putting in labels and system calls (ROM calls for Disk BASIC) that appear to be nothing more than a branch instruction to some location in memory. You can spend additional weeks putting in labels and dissecting a ROM call, and still have 10 percent of the program remaining a mystery.

Worse yet, when you finally figure out Radio Shack's ROM and feel you're ready to go on to more serious applications for the Color Computer with FLEX or OS-9, you need to start all over again and figure out system calls for those operating systems.

Now you have three sets of system calls that confuse you, and you're still in the dog house. You must decompose all those foul data tables that keep rearing their ugly heads again and again. How will you ever get free of this tedium, and move into the serious modification of your existing software for more effective operation?

Dynamite + to the rescue! It is a disassembler that gives you more than you ever thought possible from a disassembler on the Color Computer.

Dynamite + comes on a single diskette to run on the Color Computer under OS-9. Other versions are available for standard OS-9, UniFLEX and 6809 FLEX (including FHL FLEX). It disassembles both 6800 and 6809 object code, and code originally produced under TRS-80 Color Computer Disk BASIC (CoCo DOS) and FLEX! Now with OS-9, O-PAK and *Dynamite* +, you have a serious disassembler for *all* your CoCo programs.

What amazed us most of all is that the resultant source code from the disassembly can actually be reassembled and executed. Although this is not an industry first, it's the first we've seen on the CoCo.

Reassembly is possible because *Dynamite* + produces labels automatically from any memory references within a program. Better yet, those addresses that are outside the actual program (system calls) are defined by EQU statements grouped together at the start of the text file. You can define label names as your own standard label names as well, giving super meaningful disassemblies. You have control over the entire disassembly by defining any block of code as data.

When getting started, you will have to get accustomed to the requirement to perform multiple disassemblies to obtain your completed source code listing. If you're looking for a disassembly without *any* work on your part, think again. *Dynamite* + requires a lot of work on your part. The dividends, though, are well worth your efforts, in the form of disassembled listings that reflect assembly source code down to the last system call.

Speed is not one of *Dynamite* +'s strongest suits. The work is, however, much easier with *Dynamite* +. Each disassembly step requires three passes of the program, and the disassembly requires a minimum of two steps to get a usable listing. A complete disassembly will require six steps, and a lot of patience on your part. The end product is worth the wait, and your extra work will provide you with more than you ever hoped for from any disassembler.

This package doesn't stop with the *Dynamite* disassembler. It comes with three additional utilities in the package.

You'll get a memory save utility *(SAVEM)*. This is very different from OS-9's *SAVE* command. What makes this so valuable is that it allows you to save a block of memory in CoCo DOS, OS-9, FLEX or Motorola format. It's starting to look more and more like this is the missing link to give you all the utilities you'll ever need.

You can then use the *Convert* utility to convert an object code file on disk from either Motorola or OS-9 format to CoCo DOS or FLEX format. And finally, there is an *XREF* utility, that lists all line numbers of an assembly listing that refer to a label in your disassembled listing.

There was a serious problem with loading *Dynamite* + on the Color Computer. It kept telling us that we weren't using a Color Computer. That presented a problem, because we were using a Color Computer (an E-board, self-converted to 64K). Not being overly fond of such problems, Dale found the solution. We loaded CCIO (we'd been using Word-Pak and hence deleted CCIO from the boot). We tried to load *Dynamite* + on his GIMIX and came up with another problem. We then loaded CCIO on the GIMIX, and it still wouldn't run. The program seems to do some checks to verify which machine it is on, so be aware that if CCIO is dumped and Word-Pak is your normal output, you will have to load CCIO while running *Dynamite* +.

At the cost of other OS-9 software, you'd expect to pay a lot for a package with the capabilities of *Dynamite* +. At $59.95, it's a real bargain.

(Computer Systems Center, 13461 Olive Blvd., Chesterfield, MO 63017, $59.95)

One-Liner Contest Winner . . .

This is a one-line kaleidoscope. Hit the space bar any time to start the program over. Type in this program and *RUN*.

The listing:

```
0 CLS0:X=31:Y=15:FORZ=0TO1STEP0:
IFINKEY$=" "THENRUNELSER=RND(8):
X=X+RND(3)-2:Y=Y+RND(3)-2:IFX<0T
HENX=1:NEXTELSEIFY<0THENY=0:NEXT
ELSEIFX>31THENX=31:NEXTELSEIFY>1
5THENY=15:NEXTELSESET(X,Y,R):SET
(63-X,Y,R):SET(X,31-Y,R):SET(63-
X,31-Y,R):NEXT
```

Rich Dersheimer
Amarillo, TX

(The author of this winning one-liner contest entry will receive this month's RAINBOW ON TAPE.)

Stomp Your Opponent With *Stomp* — Just For Fun

Stomp is a 32K Extended Color BASIC program with *PMODE 3* graphics that uses one or two joysticks, and/or keyboard. It is designed to be played by two to four players, aged six to 60. More players mean more chances to stomp your competition. Players that enjoy strategy games, as well as plain old revenge, will enjoy this game. It is played on a 15 by 17 grid with 15 squares removed from the center. Each player is given a representative symbol (i.e., a plus sign, circle, or triangle) and an equal number of "chips," always totaling 240 in number. The object of the game is to be the first player to run out of chips. To rid yourself of your chips, you must move through the grid and on each square that has not been passed through previously, leave one chip. The square is then marked with that player's symbol. You can give your opponent chips by stomping their present position which is marked by a blue symbol. When stomping an opponent, the number of squares passed to get to their symbol on that turn is totaled, and many chips are subtracted from your total and are given to your opponent.

Each player's name is input to the program, and, in turn, each player is identified by name and asked to roll three electronic dice by pressing a key or joystick button. On your screen you watch representations of dice rolling and randomly stopping. In each turn the players must move their symbol for each of the numbers shown in a horizontal/vertical/horizontal, or, vertical/horizontal/vertical pattern. If the dice roll was 6,2,3; then the move would possibly be six squares right, two squares up, three squares left. Each number must be used on time. If it is impossible to use all three numbers and stay within the grid then you must give up your turn. When you get rid of all your chips your symbol stops and you cannot move any farther, although your opponents may still continue to stomp you and give you more chips to put you back into the game. Each of your opponents have one more chance to try to stomp you before the game ends.

Instructions on loading are simply written and complete. The cassette tape loaded without any trouble and takes about one and a half minutes to load.

The instructions suggest that players between the ages of six and 60 should enjoy this game. Our seven-year-old lost interest quickly; he just didn't have the concentration and patience to play the entire game. On the other hand, I have been carefully plotting my strategy for a match of strength with the computer wizard of our family, who is currently away on business while mom is holding down the fort; and writing RAINBOW reviews, too!

A definite plus for this game is that no special timing or coordination skills are needed to be a successful player, so even grandma and grandpa can enjoy our CoCo and pit their strategies against the younger generation. Our family always seems to be plagued by a tight budget, and the $24.95 price seems to be a little steep for this game. I think *Stomp* could be improved by making the grid squares a little larger to reduce eye strain from the many hours of plotting revenge.

(Cancoco Software, P.O. Box 2914, Medley, Alberta, Canada TOA 2MO, cassette $24.95, 32K ECB)

— Kathy Compton

STOCK & FUND INVESTING
with the
TRS-80* COLOR COMPUTER
USE FUNDGRAF AND FUNDFILE

FUNDGRAF is a stock market analysis program that not only graphs and analyzes funds or stocks, but also makes decisions on when to BUY and SELL. Improve market timing using your COCO.

GRAPHS fund's progress (up to 200 weeks). SUPERIMPOSES for comparison: a line of constant percent growth or a graph of any other fund (or stock). CALCULATES over any time span: the percent price change and the moving average (any span). INDICATES BUY and SELL signals. **FUNDGRAF** requires 16 K ECB min.

16/32 K Tape **$49.95**
16/32 K 5 in. Disk **$69.95**
ADD $2 handling on all orders.

FUNDGRAF—A STOCK MARKET ANALYSIS PROGRAM FOR 16K EX TRS-80 COLOR COMPUTER

TRS-80 COLOR COMPUTER - TM TANDY CORP

FUNDFILE is a portfolio and account management program for securities. Manage single or multiple portfolios of stocks, mutual funds, bonds, money market funds, etc. **FUNDFILE** allows easy maintenance of all your records for accurate portfolio evaluation. NEW 32 K VERSION of **FUNDFILE** summarizes all transactions (dividends, interest, purchases and sales) between any two dates of your choice - weekly, yearly, etc. Categorizes interest and dividends paid as to tax liability (tax free, etc.) and capital gains as long or short term. Great for tax reports.

FUNDFILE REQUIRES 16 K ECB min. and 80-COL PRINTER.
5-in. Diskette only for 16 K ECB **$27.95**
5-in. Diskette only for 32 K ECB **$37.95**
ADD $2 handling on all orders.

RAINBOW CERTIFICATION SEAL

Write for free brochure for details. Dealer inquiries invited.

PARSONS SOFTWARE, DEPT. G
118 WOODSHIRE DRIVE
PARKERSBURG, WV 26101

About Your Subscription

Your copy of THE RAINBOW is sent second class mail and, for subscribers in the United States, the date of mailing is printed on the label. If you do not receive your copy by the 5th of the month of the publication date, send us a card and we will mail another immediately via first class mail.

You must notify us of a new address when you move. Notification should reach us no later than the 15th of the month prior to the month in which you change your address. Sorry, we cannot be responsible for sending another copy when you fail to notify us.

Your mailing label also shows an "account number" and the subscription expiration date. Please indicate this account number when renewing or corresponding with us. It will help us help you better and faster.

For Canadian and other non-U.S. subscribers, there may be a mailing address shown that is different from our editorial office address. Do not send any correspondence to that mailing address. Send it to our editorial offices at P.O. Box 385, Prospect, KY 40059. This applies to everyone *except* those whose subscriptions are through our distributor in Australia.

OSS Peripherals Corporation

THE INTRONICS EPROM PROGRAMMER

NEW VERSION 2.5

☐ Plugs into ROM pack port.
☐ Now programs 8K X 8 EPROM *in 15 Seconds.*
☐ On board firmware included.
☐ No personality modules required.
☐ Will program most EPROM's.
☐ High quality zero insertion force EPROM socket.

Enclosed in Molded Plastic Case

Price: $140.

OSS Peripherals Corporation

SPLC-1 Lower Case

FOR THE COLOR COMPUTER & TDP-100

FULLY ASSEMBLED, TESTED & GUARANTEED FOR 90 DAYS

$59.95

☐ TRUE LOWER CASE CHARACTERS ☐ NO CUTTING OR SOLDERING ☐ FULLY COMPATIBLE WITH ALL TRS-80C (SPECIFY REVISION BOARD) [NOT COMPATIBLE WITH COCO 2] ☐ INVERTED VIDEO AT A FLIP OF A SWITCH

YOUR SOURCE FOR THE COLOR COMPUTER

*DRIVE 0 FOR COCO	$329
*DRIVE 1 FOR COCO	$198
**GUARANTEED FOR ONE FULL YEAR*	
• DISK CONTROLLER FOR COCO	$139
• RS-232 PORT EXPANDER	$ 30
• POWER-ON L.E.D. KIT	$ 6
• FRONT RESET SWITCH KIT	$ 7
• LIBRARY CASE *HOLDS 70 DISKS*	$ 23
• NEW MULTI-COLOR RAINBOW DISKS	$ 25
• ELEPHANT DISKS SSDD	$ 23
• 8 PRIME 64K RAM-CHIPS	$ 50
• GEMINI 10X PRINTER	$299
• HAYES SMART MODEM 300	$215
F-A-S-T- UPGRADE SERVICES	*$CALL!*

NEW SOFTWARE

OS·9BBS $89.95

☐ MULTI-USER CAPACITY ☐ FASTER THAN MOST BBS's ☐ MULTI-TASKING (NO LONGER COMPLETELY TIES UP YOUR COCO) ☐ REQUIRES OS·9 AND BASIC 09

OS·9 40-Track Program $24.95

☐ NOW OPERATE 35/40/80 DOUBLE SIDE, DOUBLE DENSITY DRIVES UNDER OS·9

64K Terminal Package $19.95

☐ AFFORDABLE ☐ REQUIRES 64K MEMORY ☐ GIVES YOU 52-58K BUFFER ☐ WRITES TO DISC ☐ READS IN FROM DISC ☐ STANDARD DISPLAY

MasterCard
VISA

(Dealer Inquiries Invited)

- MINIMUM $2.00 SHIPPING & HANDLING.
- NYS RESIDENTS ADD SALES TAX.
- ALL OTHER ORDERS ADD 4% SHIPPING.

OSS Peripherals Corporation

62 COMMERCE DRIVE
FARMINGDALE, NY 11735
(516) 249·3388

Formerly Saturn Electronics Company Inc.

*OS-9 IS A REGISTERED TRADEMARK OF MICROWARE, INC.

Freeform — A Flexible, Menu-Driven Database

I like database programs. This is most probably because, as an essentially unorganized person, a database lets me organize thoughts and ideas. It lets me keep my "fingers on facts" — something I do not do very well in my head.

(In my own defense, I must say that there *are* a lot of facts in my head. I am one of the better players of trivia games, but that is another story.)

Such things as telephone numbers, addresses, appointments and the like confound me. Yet, as with most busy persons, I do not have a lot of time to mess with setting up complicated database programs, such as something like *dBase* requires.

I prefer what are called "menu-driven database programs." These are the ones that give you a lot of options on the screen, and let you set things up the way you want them to be. One of the problems with menu-driven systems, however, is that they will usually only let you set things up *their* way.

Freeform, by the United Software Company for OS-9 systems, meets the two criteria that I consider most important in establishing a database. It is menu-driven, but is structured — as the name implies — in such a way that you can design a database pretty much, well, free form.

What I am saying is that *Freeform* is flexible, yet easy to use. This is no small programming task, yet United Software Company has done it.

They do it with a concept I have not seen before — the concept of "electronic cards" in an electronic file. Each card has 13 lines of text, and you can have multiple cards for any given situation.

In working with *Freeform,* I followed their tutorial to set up an appointment calendar — not usually an easy feat. This is simply because, as far as I am concerned, there are two important criteria in an appointment calendar: the ability to show appointments by day but, also, to find some single appointment that I just *know* is sometime this week, but forgot exactly when.

Freeform makes this very easy because it uses a very different method of selecting key words in any entry. With all other database managers I have seen, you set up a very structured system and then make your data fit. In this example, you *can* set up a database with days, times, persons' names, activities and the like. But you have to define the length of each of these entries. You end up either wasting a lot of space or making the whole data entry process very complicated.

Not so with *Freeform.* This is because once you have typed in whatever information you need, you go back and select your own key words to search on. To illustrate this, let us suppose you have an entry called "Meet Mr. Jones About Taxes." You could highlight both "Jones" and "Taxes." Then, when trying to remember when it is that you are supposed to meet Mr. Jones, you can search on either "Taxes" or "Jones." Neat!

Each card can be titled, and you can have up to nine pages for each card. Since each page holds 13 lines of 37 characters each, this adds up to a lot of information available for any day.

Of course, a calendar is not very useful unless it can be printed out. This is accomplished simply, with each card printed as a separate entity. It might be nice to buy some of those continuous index cards available from a number of places and use them for *Freeform* printouts.

It is important to mention that you can use "wild cards" in your search process. So, if you wanted a list of, say, all "bid specifications," "bid meetings" and "bid lettings," you could search on "bid *" and get all three.

One thing I did not like, however, is the way in which search results are reported. When you search for a key word or phrase, *Freeform* responds with the names of the cards on which the information is contained. I would have liked it better if it just went to fetch the card itself and display it on the screen.

Freeform, by TMP Software for OS-9 systems, meets the two criteria that I consider most important in establishing a database. It is menu-driven, but is structured — as the name implies — in such a way that you can design a database pretty much, well, free form.

(TMP Software, 2431 E. Douglas, Wichita, KS 67211, $225)

— Lonnie Falk

BASIC COMPILER

MLBASIC 1.0 - BASIC COMPILER

WASATCHWARE is pleased to introduce what we feel is the most comprehensive BASIC Compiler available for the Color Computer. This BASIC compiler, called MLBASIC, is for programmers who want to create machine language from BASIC programs. Written in machine language, MLBASIC will prove to be the most powerful utility on your shelf.

COMMANDS SUPPORTED

1. I/O -Commands
   CLOSE CLOADM CSAVEM DIR DRIVE DSKI$
   DSKO$ FIELD FILES GET INPUT KILL
   LSET OPEN PRINT PUT RSET
2. Program Control Commands
   CALL END EXEC FOR STEP NEXT
   GOSUB GOTO IF THEN ELSE ERROR
   ON..GO RETURN STOP SUBROUTINE
3. Math Functions
   ABS ASC ATN COS CNV EOF
   EXP FIX INSTR INT LEN LOG
   LOC LOF PEEK POINT PPOINT RND
   SGN SIN SQR TAN TIMER VAL
4. String Functions
   CHR$ INKEY$ LEFT$ MID$ MKN$ RIGHT$
   STR$ STRING$
5. Graphic/Sound Commands
   COLOR CLS CIRCLE DRAW LINE PAINT
   PCLEAR PCLS PLAY PMODE PRESET PSET
   RESET SCREEN SET SOUND
6. Other/Special Commands
   DATA DIM LLIST MOTOR POKE READ
   REM RESTORE RUN TAB VERIFY DLD
   DST IBSHFT LREG PCOPY PMODD PTV
   REAL SREG SWP VECTD VECTI

WASATCHWARE believes that the 6809 based microcomputer is powerful enough to warrant such a compiler. MLBASIC is a BASIC compiler that allows structured programs (using SUBROUTINEs), full floating point arithmetic and other features not available with Interpreter Basic programs.

Tape- $69.95
Disk- $69.95
Both- $74.95

64K Required

NEW

WasatchWare
7350 Nutree Drive
Salt Lake City, Utah
84121
Call (801) 943-6263

Add $4.00 Postage and Handling

Send check or Money order.
No C.O.D.. Utah res. add 5% tax.

DYNACALC®

CoCo's Best & Fastest Spreadsheet System

ACCLAIMED BY THE EXPERTS

"DYNACALC is my choice for a CoCo spreadsheet."
Dan Downard, RAINBOW, September, 1984.

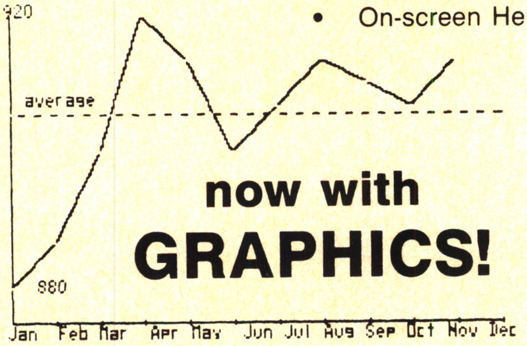
"Eat your heart out, Lotus 1-2-3!"
Scott Norman, HOT CoCo, October, 1984.

NOW ONLY $99^95

Built-in Features:

- 51 x 24 Display with Lower Case
- Super-fast Smart Screen Refresh
- Auto-Repeat Keyboard Driver
- Keysaver (TM) repeats last command x times
- Disk Operating System (works just like ROM DOS)
- Easy communication with BASIC/DOS programs
- Fast 16-Digit Arithmetic with Scientific Functions
- Summation, Mean, and Standard Deviation Functions
- Logical Functions with String & Numeric Comparison
- String locate command to navigate large worksheets
- Sort full or partial worksheet by columns or rows
- Line, Bar, Hi/Lo/Close, Circle Graphs
- Full Graphics captioning and overlay facility
- Graphics Drivers for all popular Printers
- Joystick/Mouse Driver for Cursor Movement
- Works with any ROM versions, even JDOS
- 33k Available Worksheet Space
- Up to 256 Columns or 256 Rows
- Can use VisiCalc worksheets & training materials
- On-screen Help Messages

RAINBOW
CERTIFICATION
SEAL



now with GRAPHICS!

FOR 64K DISK SYSTEMS
available from

COMPUTER SYSTEMS CENTER
13461 Olive Blvd.
Chesterfield, MO 63017 USA
(314) 576-5020

CSC

10 to 6 Mon.-Fri.

or your local DYNACALC dealer

Price US$99.95
Outside North America add $10 postage

CANADA- CDN $129.95
RGS MICRO INC.
759, VICTORIA SQUARE 405
MONTREAL H2Y 2J3
TEL.: (514) 287-1563
ORDER LINE ONLY ★ ★ ★
QUEBEC-ONTARIO-MARITIMES
800-361-5338
WESTERN CANADA 800-361-5155

MasterCard
VISA

DYNACALC Reg. U. S. Pat. Off.
Lotus and 1-2-3 are trademarks of Lotus Development Corp.
VisiCalc is a trademark of VisiCorp

Software Review

Protect Your BASIC Programs From Piracy With *Hide-A-BASIC*

If you are writing software that you are planning to market, one of the things that might cross your mind is: Will software piracy make my efforts a waste of time? If you are writing a machine language program, there are many ways you can protect your work. In BASIC, however, there is not much you can do. There is, however, some hope now with the introduction of some new software.

Hide-A-BASIC is a utility program that will allow you to completely protect your BASIC program. It does this by creating a machine language loader program which will auto-execute, and then load and run your BASIC program. Several options are available, which make it next to impossible to copy or even look at your program.

Starting up *Hide-A-BASIC* is accomplished using *CLOADM*. If you have a disk system, you must first unplug your disk controller. The program is protected by itself, so it is run automatically. The main menu then appears, which presents you with several options.

The first option that you would choose is Define Parameters. This option allows you to select the level of protection you want your program to have. You can disable the Reset, BREAK, and CLEAR keys, as well as assign new names to some of BASIC's commands. These commands include, among others, *CSAVE, LIST, PEEK, POKE,* and *Edit*. By changing the names of these BASIC commands, there is practically no way for your program to be listed or copied. The function of the BREAK and CLEAR disable is obvious. They don't work. In fact, the Reset button will just *RUN* your program all over again. If you don't disable the Reset button, you will get the familiar OK prompt if you use it. Here is where the changing of BASIC's command names comes into play. Type *LIST*, and if you have changed its name, you will get an SN Error. When you decide to change the names, you enter whatever you want as the substitution for it. For example, you could have substituted SHOW for LIST, and if you were to type in SHOW, your program would then be *LISTed*. Naturally, anyone buying your software would not know the substitute names that you used, so trying to guess them could take quite a while.

Once you have chosen all of the options that you want, you would select another main menu option that will save your customized auto-execute loader to tape. Next, you have to shut off your computer and turn it back on again, and load in your BASIC program to be protected. Saving your program to tape involves a simple *POKE* and an *EXEC*. This places a copy of your program immediately after the auto-execute loader you created before. Once you are through with all of this, you will have a protected copy of your program on tape, which can only be loaded into the computer using *CLOADM*.

Hide-A-BASIC is very easy to use, and the documentation clearly describes how to create your protected program. It does work, and there did not appear to be any way that a protected program could be copied, although I suppose someone might be able to figure it out given enough time. The only thing I did not like about it was that you have to unplug your disk controller to use it. I guess this was a necessary evil, since it also disables all of the Disk BASIC commands. If you are considering marketing cassette-based BASIC software, *Hide-A-BASIC* could be your ticket to increased sales.

(Microcom Software, P.O. Box 214, Fairport, NY 14450, 16K ECB cassette $24.95)

— Gerry Schechter

★★★ NEW ★★★

Formaker 2.0

the fastest, most complete office package yet!

Totally Menu Driven
Customize with company information & printer
Complete "on screen" instructions

FORMS
letter
invoice
quote
purchase order
mail order
confirm order
receipt

STORES
complete forms
item list
subquotes
letters
footnotes
customer info

FIGURES
quantity
list
net
discount
subtotals
tax
freight, etc.

SEPARATE CONFIGURE PROGRAM
for company info
printer options
quote & inv. #
w/auto sequencing
auto date

PRINTS
form feed
letterhead
envelope
multiple copy
emphasized

Challenger Software
3703 131st Ave N
Clearwater, FL 33520
or Call (813) 577-3998

$49 32K disc
VISA / MC
send for more information and catalog of other fine software

One-Liner Contest Winner . . .

Hour Glass will produce various colors within an hour glass-like picture. So, type in the program, *RUN* and watch the CoCo show off its colorful graphics.

The listing:

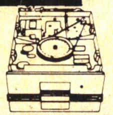
```
0 CLS0:FOR ST=1 TO 5:FOR T=0 TO
10:FOR A = T TO 31 STEP 3:B=A:FO
R Z= A TO 63-A STEP ST:SET(Z,B,C
):SET(Z,31-B,C):NEXT Z:SOUND Z,1
:NEXT A:C=RND(8):NEXT T,ST:GOTO0
```

William Montgomery
Maple Valley, WA

(For this winning one-liner contest entry, the author has been sent copies of both *The Rainbow Book Of Adventures* and its companion *Rainbow Adventure Tape.*)

your best buys!
are with SOUTH WESTERN DIGITAL

DISK DRIVES



DRIVE 0 40 track single sided	*$279.*
DRIVE 1 40 track single sided	*$169.*
DRIVE 0 and 1 SS/DD	*$428.*

(add $70. for double sided drives)

MEMORY

64K KIT (8 chips)	*$45.*

PRINTER ADAPTERS

PBH SERIAL TO PARALLEL ADAPTER	*$50.*

KEYBOARDS

HJL Keyboard	*$69.*
Micronix Keyboard	*$69.*
Keytronic Keyboard	*$79.*

DISKETTES

VERBATIM	*box of 10*	*$20.*

Southwestern Digital
1-713-480-3296
2515 W. Main #337, Houston, Texas 77098

Ordering Information
All prices reflect a pre-made discount for cash. Visa, MasterCard. orders are at regular price (add 5%).
Mail your payment directly to us, or call your order in today. All non-certified funds are held for proper clearance.

Upgrade Your Color Computer With A KeyTronic Keyboard.

Simple to install in your TRS-80 Color Computer*. A high-quality Replacement Keyboard from Key Tronic . . . the world's leading keyboard manufacturer for computer terminals.

FEATURES

- 15-20% higher data input rate compared to standard color computer keyboard.
- User programmable function key.
- Familiar typewriter layout.
- Complete legend description.
- High reliability —keys do not stick or jam.

Additional features include — high spring force on "clear" and "break" keys to prevent entry errors, full sculptured keytop array with low profile keytops, and locating "pips" on home row keys.

$69.

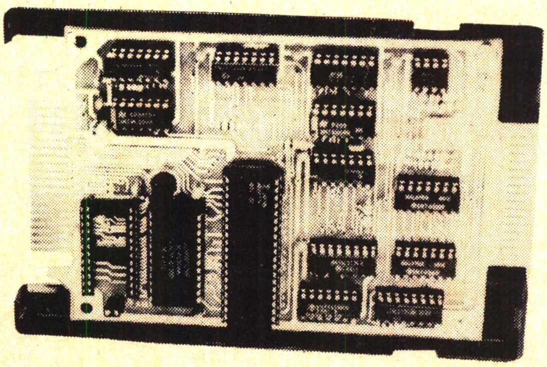
Radio Shack
TRS-80
COLOR COMPUTER
BREAK
ENTER
CLEAR
SHIFT

SOUTHWESTERN DIGITAL
2515 W. MAIN #337
Houston, Texas 77098

Visa/ MasterCard add 5%

NEW! HDS FLOPPY DRIVE CONTROLLER

HARD DRIVE SPECIALIST
COLOR COMPUTER CONTROLLER



FEATURES:

- GOLD PLATED EDGE CARDS
- DUAL SELECTABLE ROM SOCKETS
- NO POTS TO ADJUST
- COMPATIBLE WITH COCO I & II
- 120 DAY WARRANTY
- DOUBLE AND SINGLE DENSITY
- FULLY SOCKETED BOARD

REDUCE YOUR I/O ERRORS WITH THE NEW HARD DRIVE SPECIALIST FLOPPY DRIVE CONTROLLER FOR THE COLOR COMPUTER. GOLD EDGE CARD CONNECTORS AND THE ABSENCE OF POTENTIOMETERS MAKE THIS THE BEST BOARD AVAILABLE TO DATE. SOLD WITH AND WITHOUT ROM (Read Only Memory)

COMPLETED & TESTED BOARD WITH ROM .... (INCLUDES CASE, AND DOS INSTRUCTIONS)	$139.00
COMPLETED & TESTED BOARD WITHOUT ROM .... (INCLUDES CASE)	$119.00
BARE BOARD WITH INSTRUCTION MANUAL .... (ADD $40. FOR COMPLETE PARTS KIT, ADD $20. FOR ROM)	$39.95

HARD DRIVE SPECIALIST

Ordering Information
We accept Visa, Mastercard, Wire Transfers, and Certified checks for quickest shipping. Orders received on personal checks are held.

Dealer inquiries invited
16206D Hickory Knoll, Houston, Texas 77059

Order Line
1-800-231-6671
Local Sales and Service Line
1-713-480-6000

Deputy Inspector Will Organize Your Disks

I know that program is on this disk somewhere! If only that directory wasn't so long and jumbled! Enter the deputy — *Deputy Inspector*, that is. This directory utility by Sonburst Software can help you sort out the mess on that disk fast and easy.

The package is supplied on disk with a 31-page spiral bound manual, including an index, which is more than sufficient. The program consists of a BASIC loader and a machine language routine written for 64K Color Computer. A list of variables used in the BASIC loader program is given in the manual along with their possible values. The default values are contained in data statements within the loader any may be changed to suit your particular needs. The variables you may change are: Baud rate, sort sequence by program extension, and stepping rate. After changing any default values you may then save the loader program again for future use. The Baud rate may also be changed on a temporary basis from one of the main menu options.

You begin the program simply by typing *RUN DI*. The main menu appears offering six options. A seventh option, 'K', toggles a keyclick on or off but does not appear on the screen as an option. Following is a listing of the remaining six main menu options:

D — displays directory submenu containing eight additional options
F — displays format and backup submenu containing three additional options
O — allows selection of single default drive
M — toggles between multiple drives or single drive
B — allows the default Baud rate to be temporarily changed
V — toggles the verify write operations on or off

The 'D' and 'F' options are the two providing the useful utilities. From the directory submenu you may do the following.

D — display directory 11 lines at a time. You may then: 1) kill unwanted files, 2) copy files, 3) move filenames within the directory, 4) obtain start-end-execute address of machine language files, 5) alphabetize directory, 6) sort directory on filename extensions, 7) rename files. All this is performed on a memory image of the directory. The directory on the disk is not altered until it is written back to disk using the 'W' option.
P — print directory
A — alphabetize directory, erasing killed files
E — sort by extension
C — change disks to read another directory. This prevents overwriting the wrong directory on a particular disk.
W — write the directory in memory to disk
S — save directory of disk to track 34 if available
R — writes track 34 to track 17 if track 34 contains a saved directory

---

TCE News Release

MONDAY OCTOBER 1, 1984 *GAITHERSBURG, MARYLAND*

In 1985 TCE Will Introduce CHILD'S PLAY

Mouse Technological Software For The Color Computer!

Ted Malaska, President & Co-founder of TCE Programs Inc., announced today a new division for the development of business software.

The new division will distribute a series of machine language business programs, under the name *Child's Play* beginning in the first half of 1985. The *Child's Play* series will use mouse technology and what Mr. Malaska termed "*Floating Overlays*", to control the operations within the program.

When asked why the name *Child's Play* was selected for a business series, Mr. Malaska responded: "Floating Overlays will make the program operation seem like *Child's Play*, compared to other business software of today."

TCE™

Send for FREE Catalog

TCE BUSINESS DIVISION
P.O. BOX 2477
GAITHERSBURG, MD 20879
1-(301) 963-3848

MasterCard VISA

Using the above features you may then rearrange your directories in any way. They may be alphabetical, sorted by extension, or moved around one file at a time. You may even place multiple copies of a file on the same disk using the same filename if you wish.

The format and backup submenu allows you to format one or more tracks; perform a standard disk backup; or perform a collated backup.

Combining the directory features with the collated backup feature, it is possible for you to place a file in a particular location in your directory and perform a collated backup, thus placing your desired file on specific tracks of your disk. A collated backup does this by taking your first directory entry and relocating its gran allocation to start with the first gran on track 0. The second entry will be saved immediately following the first and so forth. By counting up gran allocations, you can actually place a file on a specific track by relocating it in your directory. This can minimize your drive head movement and improve on loading time for large files.

Also included on my copy of the disk is a program called *NOCO/BAS*. At first I thought this was part of the *Deputy Inspector*, but after listing it, it did not appear this was so. It will execute as a stand-alone program and is a number converter program with its own menu. Given the most significant and least significant bytes in decimal, it will give you the number in decimal, binary, and hexadecimal. You may also convert from decimal, binary, or Hex to the remaining number types not used as the source number. You may also scan memory between any two addresses, routing it to a printer if you like. This program was never mentioned in the manual so I assume it was a minor bonus.

The only feature of the *Deputy Inspector* I was unable to test was the printer options since I do not have a serial to parallel converter to interface my computer and printer yet. I can only assume that these features will perform as well as the rest of the program has. If you have a need to organize your directories or rearrange your disks, *Deputy Inspector* should do the trick for you.

(Sonburst Software, 233 S.E. Rogue River Hwy., Grants Pass, OR 97527, $21.95)

— Larry Birkenfeld

The Pond Shapes And Sharpens Problem Solving Skills

The Pond, from Sunburst Communications, is an excellent program to teach pattern recognition, prediction, and logic. It is suitable for second-graders through adults, and requires 32K of memory and a disk drive.

The object of the program is to help a frog jump through a maze of lily pads to a magic pad on the other side of the pond. To do this successfully the student has to identify the pattern of directions to be followed in order to cross the pond. The patterns may be two, three, or four steps according to the level of play selected.

At the beginning of the program, the student may select either a practice or game mode. The practice option allows the student his/her choice of any of six different ponds. Each successive pond is a degree of difficulty harder.

The first two levels utilize two-step patterns, the next two have three-step patterns and the final two patterns require discovering four-step patterns. The odd numbered patterns have only those pads necessary to form the pathway to be followed; the even numbered patterns have extra lily pads on the pond to make it more difficult to discover the pattern.

The screen shows only a portion of the entire pond at any one time. The frog can be moved within the pond by using the four arrow keys. If the student needs help, she/he can press the zero key and get a view of the entire pond. Once the student believes the pattern has been discovered, the CLEAR key is pressed and the program prompts the student to enter the pattern using the arrow keys and the number keys to describe the pattern (e.g., two right, four up). The ability to erase keying mistakes is built into the routine.

Once the pattern is entered, the student may begin execution of the pattern by the frog. If the pattern is correct the frog will reach the magic lily pad and visual and audio reinforcements are given. If the pattern is incorrect, the frog

MIND MASTER tm

"ROOTS" GENEALOGY PROGRAM KEEPS FAMILY TREE DATA FOR 7-9 GENERATIONS (MEM DEP), PEOPLE, ANIMALS. ASSEMBLES ORGANIZES. PHOTOREADY PRINTS. 32K EXT TP/DSK $20.00

"INVENTORY ONE" (ALAN ROUSE) EFFICIENT FOR BUSINESS, HOME, CLUB. 32K=148 RECORDS. PRINTS STATUS REPORTS AND REORDER REPORTS. 16K-32K EXT TP/DSK $30.00

"KWIK GRAF" 80-COLUMN PRINTER WITH TRS-80 MODE BLOCK GRAPHICS PRINTS PHOTOREADY BARGRAPHS. NO SCREENPRINT PROGRAM REQUIRED. EXCEPTIONAL! 16K EXT TP/DSK $20.00

"ADDRESS ONE" ADDRESS FILE DATABASE. SEARCH, PRINT, VIEW 1-UP LABELS, OTHER DATA. 16K EXT DSK $20.00

"SPEED MATH" (T. GRAY) LEARNING GAME FOR PARENTS AND CHILDREN, TEACHERS. MAKES MATH FUN FOR ALL AGES. GAME SCORING AND SKILL LEVELS. PROVEN.16K EXT TP/DSK $8.00

"FILE TWO" A DATABASE PROGRAM LETS YOU PUT COMPUTER TO IMMEDIATE USE. MAKE THIS PROGRAM A FIRST PURCHASE. WITHIN MINUTES, MENU HELPS YOU CREATE AND NAME UP TO 10 FIELDS. YOU CAN ENTER DATA, EDIT, DELETE, DISPLAY, SEARCH AND LOCATE ANY RECORD BY NUMBER OR BY FIELD CONTENTS. MACHINE LANGUAGE GIVES "SUDDEN SORTING". HAS 2 TOTAL FIELDS FOR ACCOUNTING USE. PRODUCES MAIL LISTS. MEMORY SENSING. GOOD! 32K EXT TP/DSK $20.00

"FILE ONE" A DATABASE PROGRAM MUCH LIKE THE ABOVE. FREE FORMAT RECORDS, M/L SORT. 32K EXT TP/DSK $20.00

"CAVE OF ALLAH" HIGH RESOLUTION GRAPHICS ADVENTURE. ONLY MINDPOWER CAN HELP YOU FIND THE TREASURE, ESCAPE THE VALLEY OF MYSTERY.MINDPOWER!32K EXT TP/DSK $15.00

WEST BAY COMPANY

W B

ROUTE 1, BOX 666
WHITE STONE, VIRGINIA 22578

POSTPAID. VA ADD 4% TAX. SEND SASE FOR PROGRAMS LIST

will wind up in the water and swim back to the starting point.

After the pattern has been successfully or unsuccessfully executed, the student is asked to do the same problem over again or select a different level.

The game option can be used by either one or two players. The student(s) may choose their starting level. They must complete each level three times before moving to the next level.

At the beginning of each game, each side gets 35 moves. Moves are used up as follows: one move for each time the arrow keys are used to move around the pond, 15 moves for using the zero key to view the entire pond, and five moves for entering an incorrect pattern. When students have successfully completed three different patterns at one level they will advance to the next level with another 35 moves added to the moves they have left.

If the students successfully complete the last pattern, a frog will appear sitting on a mushroom with a graphics display of colors around it.

I reviewed two different distribution packages. One was geared for the teaching professional and the other for the home. The documentation in each package was well-written, but I would suggest the non-professional purchase the package for the home as the documentation will be easier to follow. Each package contained the program on a copy protected disk.

The game mode allows the student to develop the necessary strategies to complete the game with the least amount of moves. The student will have to make decisions such as: should I use the arrow keys to explore the pond, try an unsure pattern, or use the zero key to view the entire pond? I feel the game would be excellent as an approach to group problem solving by using teams of multiple players for each side.

The animation is adequate. The horizontal and vertical scrolling of the screen is not really quick, but neither is it distracting. As a teaching aid to improving problem solving skills, the program is top-notch. The astute student will soon start to use some lateral thinking to discover the patterns involved in the least amount of moves. The younger student will profit from the practice mode.

The program loaded and executed properly. The initial menu allows the selection of a well-written set of on-line instructions. The instructions were adequate, but I had a problem in discovering the patterns in the harder levels. For example, the pattern might be five up, two down and three right. Once I understood that this happened in some of the later levels, it made the game even more challenging and rewarding.

The Pond, from Sunburst Communications, is an excellent program to teach pattern recognition, prediction, and logic. It is suitable for second-graders through adults, and requires 32K of memory and a disk drive.

(Sunburst Communications, 39 Washington Ave., Pleasantville, NY 10570, $40)

— Randall A. Smith

AVAILABLE NOW

DRAGON USER

To make the most of your new Dragon microcomputer from Dragon-Tano, you need *Dragon User* — the international, independent magazine for Dragon owners.

Each issue of *Dragon User* contains:
- reviews of the latest software
- programming advice for beginners
- hardware projects
- program listings covering games and utilities
- reviews of Dragon peripherals and add-ons
- technical advisory service
- programming articles for users

The Dragon microcomputer was launched in the UK last year. Since then we have developed a knowledge and mastery of the machine's abilities. You can benefit from our experience by subscribing to *Dragon User*, which is expanding its coverage to include all US developments.

To make sure that you receive a copy of *Dragon User* regularly, subscribe direct to us. This costs only $29.95 for 12 issues airspeeded to you — or take advantage of our special offer to long-term subscribers. Individual copies of the magazine can be obtained from your Dragon dealer.

Subscription order form. Receive a free book and save money by taking out a long-term subscription — a two-year subscription saves 10%, a three-year subscription saves 20%. In addition, long-term subscribers will receive a free copy of either ☐ *The Working Dragon or* ☐ *Dragon Games Master.* Please send a check, made payable to *Dragon User*, with this form.

Start my subscription from the following issue ....

Name ....

Address ....

....

Signed .... Date ....

Subscription rates US and Canada airspeeded ☐ US$29.95 for 12 issues/1 year ☐ US$53.90 for 24 issues ☐ US$71.90 for 36 issues. Send this form to *Dragon User*, % Business Press International, 205 E. 42nd St., New York, NY 10017.

Super Gemprint For Printing Your Masterpiece

After spending hours of work with his favorite graphics editor, Mike Angelo, artist *extraordinaire* and part-time dishwasher, has finally created the ultimate in images — graphics that would make Pablo Picasso envious. Unfortunately, Mike has one minor (major) problem: he can't seem to convince the critics to come to his studio to see his masterpiece. It appears there indeed will be no escape from our hero's dilemma. But wait—from out of the blue comes *Super Gemprint*, the wonderful new screen/printer/graphics utility from Dayton Associates.

Super Gemprint is one of those programs that can really come in handy if you ever want to print out some of those lovely graphics screens the CoCo is capable of making. I found it particularly useful because of its very large (8" x 11") printing area, which is printed sideways on a piece of standard paper. About the only disadvantages of the printout itself are the understandably blocky "characters" because of the increase in resolution from the CoCo to the printer, and the overall length of time it takes to print out the entire screen (approximately 4:[illegible]7 to print out entire screen at 9600 Baud).

The good points of the program, however, greatly outweigh these minor details. The printout area is, of course, the major advantage of the program. It also takes up very little space in memory. The major feature in my eyes, however, lies in the program's ability to specify the color's representation on the printer. For example, many times when graphics are printed out normally the foreground and background colors do not appear in the most pleasing ways. Many times I have printed out what looked a veritable masterpiece on my color screen, but it lost an awful lot in the translation. (Once a picture of a snowman inverted the snow to black and the chimney smoke white against a black sky — yuck!) The writer of *Super Gemprint* obviously had run across the same problem. Because of this, the instructions include a small procedure for modifying the tables to the correct (best-looking) colors. As they say, the little things mean a lot.

Overall, *Super Gemprint* is very well-written and documented. In fact, the only legitimate complaint I have against the program really isn't about the program itself — it was the documentation's constant state of change. It took no less than two updates from the original (hand-corrected) documentation to become complete. Now, however, I have been assured that the documentation as I have it is complete, as it indeed appears to be. So, if you are looking for a screen-print program for your Epson/Gemini/Delta/Radix/etc. printer, then Super Gemprint appears to be a 'gem-dandy.'

(Dayton Associates, 7201 Claircrest Bldg. C, Dayton, OH 45424, tape $17.95 plus $2 S/H)

— Eric Oberle

PERRY COMPUTERS

COLOR COMPUTERS

CALL TOLL FREE 1-800-248-3823

COLOR COMPUTER, DISK DRIVE AND PRINTERS

	LIST PRICE	OUR PRICE
26-3136 16K Extended Color Computer 2	$ 139.95	$ 120.00
26-3127 64K Extended Color Computer 2	$ 199.95	$ 169.00
26-3029 Disk Drive 0 for Color Computer	$ 349.95	$ 295.00
26-1161 Disk Drive 1, 2, 3 for Color Computer	$ 279.95	$ 230.00
26-1276 DMP-105 80 cps Dot Matrix	$ 199.95	$ 169.00
26-1271 DMP-110 50/25 cps Triple Mode Printer	$ 399.95	$ 299.00
26-1255 DMP-120 120 cps Dual Mode Matrix	$ 499.95	$ 385.00
26-1257 DWP-210 14 cps Daisy Wheel Printer	$ 459.00	$ 485.00

COLOR COMPUTER SOFTWARE

	OUR PRICE
Telewriter 64 Tape	$ 49.95
Telewriter 64 Disk	$ 59.95
VIP Writer	$ 59.95
VIP Speller	$ 49.95
VIP Database	$ 59.95
VIP Terminal Disk	$ 49.95
TOM MIX Software	$ CALL
RADIO SHACK Software	15% Off

OTHER PRINTERS AND ACCESSORIES

	OUR PRICE
EPSON Printer	$ CALL
OKIDATA Printer	$ CALL
STAR GEMINI 10X Printer	$ 275.00
COMREX CR-II Daisy Wheel Printer	$ 415.00
C.ITOH 8510 Prowriter Printer	$ 335.00
BOTEK Serial to Parallel Interface	$ 59.00

MONITORS

	OUR PRICE
COMREX 12" Green Monitor	$ 95.00
COMREX 12" Amber Monitor	$ 110.00
COMREX 13" Color Monitor	$ 285.00
AMDEK 300A Monitor	$ 155.00
VIDEO PLUS Monitor Adaptor	$ CALL
GORILLA Monitor	$ 85.00

COLOR ACCESSORIES

	LIST PRICE	OUR PRICE
26-2226 RS-232 Program Pak	$ 79.95	$ 68.00
26-3012 Deluxe Joystick (EACH)	$ 39.00	$ 34.00
26-3017 64K RAM Kit	$ 69.95	$ 59.00
26-3008 Joysticks	$ 24.95	$ 21.00
26-3016 Keyboard Kit	$ 39.95	$ 34.00
26-3018 Extended Basic Kit	$ 39.95	$ 34.00
26-1175 Direct-Connect Modem I	$ 99.95	$ 85.00
26-1173 Direct-Connect Modem II	$ 199.95	$ 169.00
Signalman Modem 300/1200 Baud	$ 399.00	$ 275.00
Hayes Modems		$ 215.00

All prices and offers may be changed or withdrawn without notice. Advertised prices are cash prices. For shipping, add 2% (minimum shipping charge $3.00). C.O.D. accepted. ($4.00 charge per carton on C.O.D. Call for further COD information.) M.C., Visa, AX, add 3%.

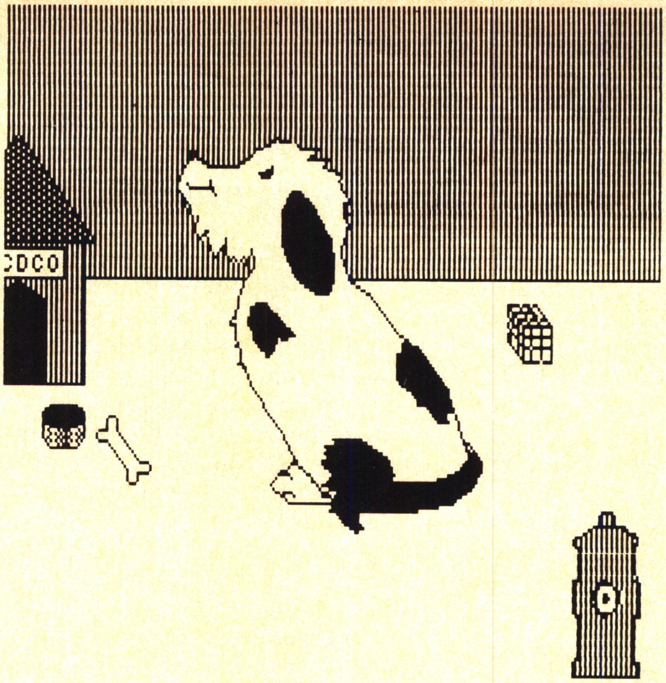
PERRY COMPUTERS • 137 NORTH MAIN STREET • PERRY, MI 48872

Oki Dump: Screen Print Utility

Oki Dump is a specialized program directed to those individuals wanting to have their Okidata printer produce hard copy of a graphics screen. The machine language program is configured for either a 16K or 32K computer, but will only work with the Okidata 80 series without Okigraph.

Both the tape and disk version are the same. However, the disk version includes a program which allows the user to find the start of a graphics screen. The disk also has two sample screen programs which are useful in testing the program and printer combination. The screen location program is listed in the manual for tape users to type in (however, no sample programs are included on the tape version).

The disk version's samples proved to be most interesting and yet frustrating. It took three attempts to get the graphic design to print out correctly. The first time through the printout double spaced; the second time it single spaced but the first few lines were out of register; the third pass produced a full 8½-inch by 11-inch hard copy. The other picture to test was a dog with a doghouse. The video is colorful and the printout, which can be made in either normal or reversed imaging, is a very good likeness of the video picture.



The program author devotes a couple of pages to getting hard copy from a particular game. As part of the instructions for getting printouts from this game, the program author also notes that there are two major problems with the attempt to get printouts. The first problem reported is that *Oki Dump* might not work with games which do not allow the program to be stopped with BREAK or Reset. Secondly, the user may have to find the location of the picture and to remember that by using the information provided it is possible to destroy the picture by overwriting. Trial and error relocating the screen search program is necessary. Also necessary is rerunning whatever program created the picture you wanted. In two attempts to get a hard copy of a graphics screen from another program, one worked as expected and the other attempt not only blew the picture but also crashed the disk!

The five-page manual that came with the program is hard to follow. The program author could have made it easier for the user if he would have continued putting "command" instructions on separate lines. The users must pull out of the middle of a couple of paragraphs the rest of the "commands" to run the program.

(Color Connection Software, 1060 Buddlea Dr., Sandy, UT 84070; tape $8.95, disk $10.95)

— Robert Foiles

THE SOFTWARE HOUSE

DATA GRADE TAPE
(with labels)
C-10 $6.95/Doz. 25/$13.95
C-20 $8.50/Doz. 25/$15.95
C-30 $9.95/Doz. 25/$17.95

"SPESHUL"
(15 Tapes, Hard Boxes, Labels and Storage Box)
C-10 $12.95 **C-20** $13.95
C-30 $14.95
Hard Boxes 25/$4.50 100/$15.00
Cass. Labels $2.75/100 $20.00/1000

SENTINEL BRAND
100% Certified Disks
SS/DD Box of 10 $18.95
DS/DD Box of 10 $26.95
SS/96TPI Box of 10 $28.95
DS/96TPI Box of 10 $37.95

Bulk Disks with Sleeves
SS/DD 10/$15.95 50/$75.00
DS/DD 10/$22.95 50/$110.00

GENERIC DISKS
SS/DD 10/$14.00 50/$65.00
Tyvek Sleeves 15/$2.00 100/$10.00

MEDIA MATE DISK BANK - Holds 50 Disks - **$14.95**
Disk Library Case (holds 10 disks) $2.00 ea. 10/$18.00
BIB DISK DRIVE HEAD CLEANER $8.95

RIBBONS:
EPSON MX/FX/RX 70/80 $7.50 ea. 6/$39.95
GEMINI 10, 10X 2/$5.50 Doz./$29.95
OKIDATA 80, 82, 92, 93 2/$5.50 Doz./$29.95
OKIDATA 84, 94 $6.00 ea. 6/$30.00

HIGH SPEED DATA DUPLICATION
Speech, Monaural Programs. Call or Write for Quote.
ALL ITEMS 100% GUARANTEED!
Add $2.50 for s/h.........in Mich. add 4% sales tax.
Make check or money order payable to:
"DALLAS COX"
9020 Hemingway, Redford, MI 48239
(313) 937-3442
Clubs & Dealers - call for quantity prices.

CARMATE — — MEMODATA

CARMATE isn't a program. It's a system designed to help you track preventative maintenance, repair costs, and other data about your car. Contains extensive features.

Disk version only **$35.00**

Stop sulking over important events which you forgot. MEMODATA remembers them for you. Versatile, easy to use.

Disk and cassette versions **$15.00**

★★Bonus Programs — Program Support — Programming Service★★

For More Info or to Order, Please Write:

COMPUGRAM
P.O. BOX 26663
RICHMOND, VA 23261
(804) 644-8249

In Assembly Language — A Must For Any Programmer

As everyone knows, the way to get the best performance and memory utilization out of your CoCo is to code in 6809 assembly language. Unfortunately, assembly language programming can sometimes be a tedious procedure with simple, common tasks often consuming valuable coding and debugging time. Professional programmers minimize this problem by taking advantage of libraries of previously written routines called system libraries. *In Assembly Language,* by Larry Landwehr, is both a library of useful routines for the 6809 and an aid for learning 6809 assembly language.

The *In Assembly Language* package consists of a tape containing 18 6809 assembly routines and a notebook containing documented listings and associated commentary. Among the 18 routines are a number of common, general-purpose routines for keyboard and file I/O, interface to joysticks, and string and numeric display. Additional routines provide functionality for random number generation, high resolution graphics and sound generation. In practice, the programmer uses a particular routine by merging its source code with his own, then assembling as usual. (On more sophisticated systems, library routines are usually linked in rather than being assembled in.)

Each of the 18 routines provided in the *In Assembly Language* package was developed using Radio Shack's *EDTASM+* editor, assembler and debugger, then stored on tape in ASCII format. This implies that almost any assembler on the market may be used. The quality of the code and the in-line documentation were both very good.

The commentary provided with each listing presents some of the background information and design considerations that went into the development of the code. When used in conjunction with a standard text on 6809 assembly language programming, the *In Assembly Language* manual provides an excellent introduction to systems level programming on the CoCo. Along these lines, the package also includes several more advanced routines demonstrating techniques such as threaded code and multitasking.

Overall, I was very impressed with the quality of the *In Assembly Language* package. The routines were well documented, well debugged and easy to use. In addition, the commentary provided with each routine provides some good insight into the inner workings of the 6809 and the CoCo. For the money, *In Assembly Language* is a must for any assembly language programmer.

(Dataman International, 125 S. Fifth St., Lewiston, NY 14029, $23.95)

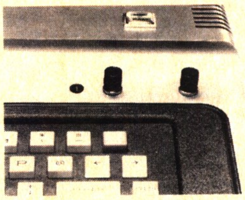
— Gary E. Epple

RESET-POWER-SWITCHES
A REAL IMPROVEMENT

Move the power switch and reset switch where they belong. An LED power on light too! High quality parts. D, E boards and CoCo 2 totally solderless kit. F board requires soldering.

Reset 1 CoCo 1 $24.95
Reset 2 CoCo 2 $27.95

Either kit add $2.00 shipping and handling



SAM DIAMOND, P.I.

The first of our new Sam Diamond graphic adventures. More than 30 detailed high resolution graphic scenes. A killer is loose in the city. Can you bring him to justice before he gets you? Excellent graphics and a tough mystery to solve.

32K EXB Disk Only $29.95
plus $2.00 shipping and handling

SAM DIAMOND, P.I.
Copyright
1984
by
Philip Durr
and
John Kovach
Graphic Editor
Linda Nielsen
Licensed to
Moreton Bay
Software

THE COCO-SWITCHER
A QUALITY PIECE OF HARDWARE

The CoCo Switcher allows you to hook up three peripherals to your RS-232 jack. Connect your modem, printer and any other RS-232 compatible peripheral to the CoCo Switcher. An LED on the CoCo Switcher shows if your computer is on or off at a glance. The LED flickers when transmitting or receiving data.

Dimensions: 2½" (64 mm) x 4" (102 mm) x 5 7/8" (150 mm)
$39.95 plus $2.00 shipping and handling

MORETON BAY SOFTWARE
A Division of Moreton Bay Laboratory

316 CASTILLO STREET
SANTA BARBARA,
CALIFORNIA 93101
(805) 962-3127

LOGO Starter: A Place To Begin

As the name implies, *LOGO Starter* is designed as a first experience with Color LOGO. It allows the first-time LOGO user to create interesting figures with single keystrokes (plus ENTER, of course). The program does not require a knowledge of the LOGO language nor does it require typing long program statements.

The program consists of a series of LOGO procedures and subprocedures that define specific turtle actions. If you are familiar with LOGO, you know that each procedure must be assigned a name by which the procedure is accessed (executed). By naming the procedures used in *LOGO Starter* by individual keys, the authors provide the means to run a procedure by pressing a single key followed by stroking the ENTER key. For example, pressing 'L' on the keyboard causes the turtle to draw a diamond (providing the drawing pen is in the down position). This action results from a procedure in the program named *L*.

```
TO L                         name of program
 SH 315                      set heading to 315 degrees
 REPEAT 4(FD 18 RT 90)       draw square
 SH 0                        set heading back to zero
END
```

Since the program has been named *L*, it will run from Color LOGO's *RUN* mode by pressing the 'L' key (and ENTER).

LOGO Starter provokes the thought, "Why didn't I think of that?" Its simplicity is ideally suited to the LOGO language. Yet, the program also displays the power of LOGO. From simple keystrokes, great ideas grow. Since the program is written in LOGO, it would be very easy to change the procedures to perform any actions that you wish. Parents, teachers, or any 'LOGO learner' can therefore alter *LOGO Starter* to fit their own wishes or needs. Thus *LOGO Starter* can serve as a base for learning how procedures are constructed and how they work. Studying existing programs and changing them to "custom fit" is the key to learning how to program in any language. It is particularly effective in LOGO for studying simple, visual results of individual statements.

The program comes with a four-page printout that describes the program's functions and use. The functions of the keys are not described in detail. This is unnecessary as the program is designed for exploration and experimentation. The user will soon learn to associate keys, symbols, and the actions that result from their use.

Keyboard overlays are included to provide a means to identify keys with symbols that represent their functions. Since a variety of keyboards have been used for different Color Computer configurations, *LOGO Starter* includes a variety of overlays so that each computer version is provided for. Also included are self-sticking symbols for the lower three rows of keys. Sticking these symbols to the front faces of the keys provides quick matching of functions to the correct keys.

The program provides use of Color LOGO's BREAK, RUN and DOODLE modes. Keys provide the usual FORWARD, BACK, LEFT and RIGHT moves and turns. A number of keys draw simple shapes. Certain moves can be erased by double keystrokes. As mentioned, changes and additions to the program can be made. This is done in the EDIT mode.

The simplicity and flexibility of this program make it ideal as a learning vehicle for Color LOGO and more generally for computer familiarity. The ability to modify the keystroke functions is particularly valuable.

(B & B Software, P.O. Box 210, Jenkintown, PA 19046, cassette $13.95, Color LOGO [Radio Shack Catalog No. 26-2722] necessary)

— Don Inman

DYNAGRAPH

Copyright 1984 by Derringer Software, Inc.

A utility program for owners of DYNACALC®

DYNAGRAPH will transfer graphic files from DYNACALC to standard graphic files for further enhancing and labeling by graphic editing programs such as MASTER DESIGN.

DYNACALC stores its graphic displays in a way that is not accessable by the standard LOADM command. DYNAGRAPH will convert these to files that can be LOADMed by most any graphics editing program such as MASTER DESIGN. DYNAGRAPH will also convert a standard hi-res display into the format that is needed by DYNACALC. DYNAGRAPH can reduce a graph vertically and horizontally so that multiple displays can be combined into one.

DYNAGRAPH $19.95
MASTER DESIGN $29.95
DYNAGRAPH + MASTER DESIGN $44.95
DYNACALC $99.95 (DYNAGRAPH INCLUDED!)
ALL 3 Programs $119.95

Include 3.00 for UPS Shipping — 5.00 U.S. Mail — 9.00 Air Mail

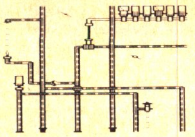
Send orders to: Derringer Software, Inc., P. O. Box 5300
Florence, S.C. 29502-2300
Visa/Master Card: (803) 665-5676 10:00 am to 5:00 pm EDT

DYNACALC is a registered trademark of
Computer Systems Center
MASTER DESIGN (C) 1984 by Derringer Software, Inc.

CO CO -ADS

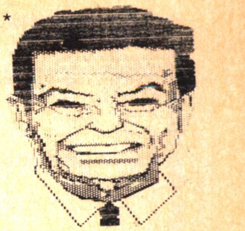
A MONTHLY CLASSIFIED NEWSPAPER

FOR THE COCO OWNER - SELL YOUR USED ITEMS. CIRCULATION OF OVER 15,000 - YOUR SURE TO SELL. SUBSCRIPTION IS ONLY $5.00 A YEAR CLASSIFIED ADS ARE ONLY .25 PER WORD.DISPLAY ADS AVAILABLE. PLEASE HAVE CHECKS PAYABLE TO P D SOFTWARE PO BOX 13124 HOUSTON TX 77219



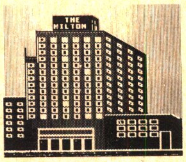
From the programmer that brought ZAXXON* to the Color Computer,** Moreton Bay Software proudly presents

BJORK BLOCKS.



An incredible graphic utility! Now you can design grapics just like the masters. You can even animate! User friendly. Precision drawing. Precision color selection. Fully menu driven. Only one joystick needed for menu selection and graphic creation. Compressed data storage or load and save 6K binary files. Almost impossible to crash. Create your own graphic adventure screens. Limitless applications in communication, education and program development. Read the October review by *Rainbow's* Technical Editor.

Pictures created with Bjork Blocks



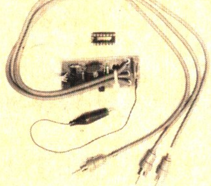
Requires 32K Extended Basic
(64K for animation)

$34.95 Tape or Disk

SPECIAL: Bjork Blocks and Graphicom $55.00

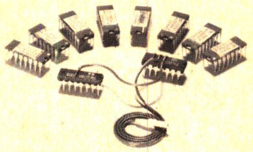
DOUBLE DRIVER

The BEST monitor driver available. Color composite, monochrome and audio output. For original CoCo D, E and F boards. $24.95



Mono II for Color Computer 2. An excellent monochrome monitor driver that has audio output also. $24.95. **Specify model needed.**

64K UPGRADES

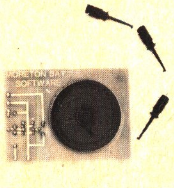


Pretested.
Guaranteed.

Instantly access 64K via M/L totally solderless kit to upgrade E Boards. Kit includes eight 4164 prime chips and chips U29 and U11 already soldered. E Board Kit $69.95
Color Computer 2 kit requires soldering. $64.95

MINI MOUTH

Add sound to your mute monitor. Hear the bells and whistles of your software again. No batteries. Solderless installation. For CoCo I D, E and F boards and CoCo 2. $24.95



MORETON BAY SOFTWARE

A Division of Moreton Bay Laboratory

316 CASTILLO STREET
SANTA BARBARA,
CALIFORNIA 93101
(805) 962-3127

VISA MasterCard

Ordering information

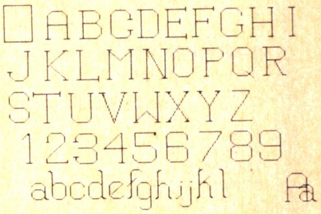
Add $2.00 shipping and handling per order. We ship within 24 hours on receipt of order. Blue Label Service available. California residents add 6% sales tax.

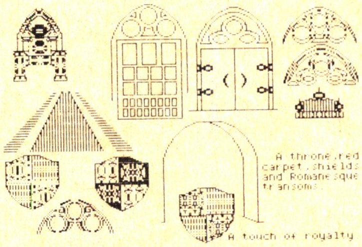
GRAPHICOM

Buy Graphicom from us and get one of our unique picture disks free! Get our improved picture disk one also. Graphicom is an excellent graphic utility. See the *Rainbow* review. Requires 64K EXB, Disk Drive and Joy Sticks. THREE Disks and the manual for only $29.95.

100% New Graphicom Picture Disks $15.95

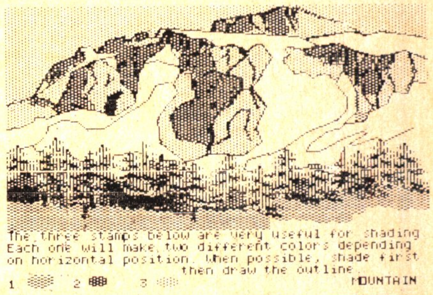
Caligraphy Stamp Set Disk




A throne, red carpet, shields and Romanesque transoms.
A touch of royalty

Adventure Disk I (indoor scenes and objects)

Adventure Disk II (outdoor scenes)



The three stamps below are very useful for shading Each one will make two different colors depending on horizontal position. When possible, shade first then draw the outline.

MORE BUSINESS -Ver 3.12 The *preferred* business package. Completely interactive. General Ledger. Accounts Receivable. Accounts Payable. Customer Statements. Mailing Labels. Profit/Loss. Balance Sheet Statements. Our most powerful business package. Buy the best!

32K Disk R/S DOS $99.95

*Zaxxon Reg TM Sega Corp.
**Color Computer Reg TM Tandy Corp.

TAKE AN ADDITIONAL 3% DISCOUNT WITH CHECK, MONEY ORDER OR C.O.D.

★★★★★★★ SELECTED SOFTWARE ★★★★★★★
FOR THE COLOR COMPUTER

UPGRADE YOUR COLOR COMPUTER!

COMPLETE SOLDERLESS KITS WITH EASY-TO-FOLLOW INSTRUCTIONS.

4K-16K FOR ALL BOARDS	**$19.95**
4K-32K FOR ALL BOARDS	**$54.95**
16K-32K FOR ALL BOARDS	**$39.95**
64K For E & F BOARDS & COCO 2	**$59.95**

IF POSSIBLE, PLEASE SPECIFY BOARD REVISION WITH ORDER.

★★★★★★★★★★★★★

SPECIAL OF THE MONTH

CANDY CO (32K)
TAPE OR DISK **$24.95**

THE HJL-57 KEYBOARD

WITH FREE SOFTWARE FOR FOUR FUNCTION KEYS.

REG. $79.95 **SALE $74.95**

*Please specify model (original, F version or COCO 2)

DISKETTE CAROUSEL

WITH 72 COLOR-CODED ENVELOPES.

REG. $29.95 **SALE $24.95**

VOLKSMODEM

300 BAUD, DIRECT CONNECT, ORIG/ANSWER AUTOMATICALLY SELECTED	**$59.95**
COCO CABLE	**$ 9.95**
PHONE CABLE	**$ 4.95**

BOOKS

COLOR BASIC UNRAVELLED	**$19.95**
EXTENDED BASIC UNRAVELLED	**$19.95**
DISK BASIC UNRAVELLED	**$19.95**
ALL 3 BOOKS ONLY	**$49.95**

MONITORS

Zenith ZVM - 123 Green	**$129.95**
Zenith ZVM - 122 Amber	**$149.95**
BMC 9191 U + medium res. with sound	**$289.95**

MONITOR INTERFACE

20% OFF WITH MONITOR PURCHASED

VIDEO PLUS Color or monochrome for COCO	**$24.95**
VIDEO PLUS II C Color for COCO 2	**$39.95**
VIDEO PLUS II M Monochrome for COCO 2	**$26.95**

'REAL TALKER'

WITH ENHANCED SOFTWARE ON TAPE AND USER'S MANUAL

Cartridge $59.95

'REAL TALKER II'

SAME AS ABOVE FOR COCO 2

$69.95

Y-BRANCHING TABLE
FOR DISK SYSTEMS **$29.95**

STAR PRINTERS

Gemini 10X	120 cps	$279
Gemini 15X		$399
Delta 10	160 cps & 8K buffer	$415
Delta 15		$549
Radix 10	200 cps & 16K buffer	$615
Radix 15		$715
PowerType	DaisyWheel	$399
PBH Serial to Parallel switch selectable printer and modem interface		$79.95
Purchased with Printer		$59.95

TAKE 20% OFF ANY SOFTWARE ORDER!

All games are in 16K machine language unless noted.

TOM MIX SOFTWARE

	T	D
* DRACONIAN (32K)	$27.95	$30.95
** SKRAMBLE	$24.95	$27.95
* CRASH (32K)	$24.95	$27.95
* WORLDS OF FLIGHT (32K)	$29.95	$32.95
* SR-71 (32K Ext. Basic)	$28.95	$31.95
* TOUCHSTONE (32K)	$27.95	$30.95
* KINGTUT	$27.95	$30.95
* BUZZARD BAIT (32K)	$27.95	$30.95
* TRAP FALL	$27.95	$30.95
* DONKEY KING (32K)	$26.95	$29.95

SPECTRAL ASSOCIATES

	T	D
* GALAGON (32K)	$24.95	$28.95
* COLOR PANIC (32K)	$24.95	$28.95
* CUBIX (32K)	$24.95	$28.95
** FROGGIE (32K)	$24.95	$28.95
* LUNAR ROVER PATROL (32K)	$24.95	$28.95
* LANCER (32K)	$24.95	$28.95
* ANDROID ATTACK (16K&32K)	$24.95	—
* MS. GOBBLER (32K)	$24.95	$28.95
* WHIRLYBIRD RUN	$24.95	$28.95
* STORM ARROW	$24.95	—
* DEFENSE	$24.95	—
* GALAX ATTAX	$24.95	—
* PLANET INVASION	$24.95	—
* SPACE WAR	$24.95	—
* GHOST GOBBLER	$21.95	—
GEOGRAPHIC PAC (Ext. Basic)	$29.95	—

INTRACOLOR

	T	D
** COLORPEDE	$29.95	$34.95
* ROBOTTACK	$24.95	$27.95
** CANDY CO. (32K)	$34.95	$34.95
** WILLY'S WAREHOUSE (32K)	$34.95	$34.95
** INTRACOLOR GRAND PRIX (32K)	$34.95	$34.95

UTILITIES AND APPLICATIONS

	T	D
RAINBOW SCREEN MACHINE	$29.95	$32.95
SUPER SCREEN MACHINE	$44.95	$47.95
TELEWRITER-64	$49.95	$59.95
MASTER DESIGN	—	$34.95
HOME BASE	—	$49.95
WORK BASE I	—	$64.95
DISK UTILITY BEST	—	$24.95
COCO SCREEN DUMP for EPSON & GEMINI	$19.95	$19.95
COCO CALLIGRAPHER	$24.95	$29.95
SCHEMATIC DRAFTING PROCESSOR	—	$49.95
SPECTRUM DOS	—	$49.95
E-Z BAZE	—	$24.95
PRO-COLOR-FILE *ENHANCED*	—	$79.95
COLORCOM/E Rompack or Disk	$49.95	
64K DISK UTILITY	—	$21.95
TAPE UTILITY	$24.95	$24.95
MULTIPAK CRACK	—	$24.95

SPECIALS UP TO 60% OFF

NO OTHER DISCOUNTS APPLY.
QUANTITY LIMITED.

	TAPE
**FROGGER	$12.95
*SPACE RAIDERS	$12.95
*ASTRO BLAST	$12.95
*COLOR HAYWIRE	$ 9.95
*CAVE HUNTER	$12.95
*KATERPILLAR	$11.95
*COLOR ZAP	$ 7.95
**COLOR OUT	$ 7.95
COLOR GRAPHIC ANIMATOR	$ 7.95
COLOR GRAPHIC EDITOR	$ 9.95
TIMS	$14.95
WAR KINGS	$ 9.95
SILLY SYNTAX	$ 9.95
MASTER CONTROL II	$14.95

MORE FROM SUGAR

	T	D
THE GREAT USA	$19.95	$24.95
BIBLE STORIES	$19.95	$24.95
GALACTIC HANGMAN	$17.95	—

DATA SOFT

	T	D
* ZAXXON (32K)	$39.95	$39.95
** MOON SHUTTLE (Tape & Disk Included)	$29.95	$29.95
** POOYAN (32K — Tape & Disk Included)	$29.95	$29.95

COMPUTERWARE

	T	D
* JUNIOR'S REVENGE (32K)	$28.95	$31.95
* GRAN PRIX (32K)	$21.95	$24.95
* DOODLE BUG	$24.95	—

ANTECO SOFTWARE

ROMPAK ONLY

* 8-BALL	$29.95
* WHIRLYBIRD RUN by Spectral Associates	$26.95
* GHOST GOBBLER by Spectral Associates	$26.95

ADVENTURE INTERNATIONAL

	T	D
SAIGON: THE FINAL DAYS	$24.95	—
ADVENTURELAND	$19.95	—
EARTHQUAKE	$24.95	—
** SEA DRAGON (32K)	$34.95	—

***Requires Joystick** ****Joystick Optional**

WE PAY POSTAGE on all orders in the United States & Canada. Overseas please add $3.00. (MN Residents add 6% sales tax.) We accept Visa, Mastercard, check or money order. U.S. funds only for foreign orders. C.O.D. please add $2.00.

Send to: **SELECTED SOFTWARE**
P.O. Box 32228 • Fridley, MN 55432
OR CALL OUR 24 HOUR ORDER LINE 612-757-2439

Much Ado With *ADOS*

For those of you who are not completely satisfied with Disk BASIC supplied with your disk controller, there are alternatives. One is an enhanced version of Disk BASIC called *ADOS* from Spectrosystems. *ADOS* comes on disk and requires 64K for RAM use or it can be burned into an EPROM to replace the Disk BASIC ROM now in your controller. While Spectrosystems does not offer *ADOS* on an EPROM, they do furnish you with information on how to get an EPROM burned if you do not have access to that capability. If you do not have *ADOS* burned, it makes a powerful disk utility just as it comes.

There are several disk operating systems now available if you believe Radio Shack could have done better with their version of Disk BASIC. While each system has advantages of its own, *ADOS* has to be rated very highly. Features include: repeat and edit of last direct-mode command, automatic line-number prompts for program entry, lowercase command entry, DOS command for booting OS-9, one- or two-column directory with free grans to the screen or the printer, "COPY <filename> TO <drive number>" command, AE Error override option for *COPY* and *RENAME, RUNM* command to load and execute ML programs, *RAM* command for ROM-to-RAM transfers with a *ROM* command to return in the EPROM version; *SCAN* command lists ASCII file to screen or printer, or it gives *START, END,* and *EXEC* addresses for binary file; a mini-monitor provides hexadecimal memory examine and change capability; *PEEP* command provides movable window for viewing memory contents; no known incompatibility with any commercial software. Also included on the disk is a high resolution driver with the option of 42, 51, or 64 characters per line, with lowercase, and a customizing utility to define your own control-key abbreviations, printer Baud rate, step rate (6ms-30ms), and the ability to support two double-sided drives.

Some of these features need a little further discussion. The down-arrow key, held down while another key is pressed, functions as a control key. *ADOS* comes with 22 defined control keys. There is a maximum of 24 control keys, all of which may be redefined using the customizing utility. You are only limited to the 24 keys defined by a total of 116 characters. The contents of the start-up logo may also be changed. It is suggested that users might want to include their name in the start-up message to serve as a form of theft protection for the computer once *ADOS* has been burned into an EPROM. The main restriction is the start-up message must be limited to a maximum of 88 characters.

Double-sided drives may also be supported in that drive 2 would be defined as the back side of drive 0 and drive 3 as the back side of drive 1. You can also choose to have your disks formatted with 40 tracks instead of 35, if your drives are 40-track drives. There are some things to consider before making the decision to go with 40 tracks in an EPROM, i.e., permanence. First, although you will still be able to read 35-track disks, people with 35-track systems will not be able to read the last five tracks of your 40-track disks. This should not cause a problem until your 40-track disk is fairly full since the tracks are used starting around the directory and working outward. Therefore, the top five tracks should be the last tracks used. If you decide you do need to format a 35-track disk, a short, five line BASIC program is listed in the documentation to allow you to format a 35-track disk. A second consideration is that some disk utilities were designed for a 35-track system and simply will not function correctly with a 40-track system. Finally, while the *COPY* command allows transferring files between disks of different formats, the *BACKUP* command will only function correctly when both disks are formatted the same.

There are two programs provided on the disk that can be used with other DOSs, *BOOT.BAS* and *RSV. BOOT/BAS* is a utility that permits you to run any program on a disk by using the up- and down-arrow keys to select the desired program. It would be a good idea to put this program on all of your disks. One of the control keys comes defined as *RUN"BOOT"*. The other program, *RSV,* is a high resolution text screen that gives you 24 lines with either 42, 51, or 64 characters per line. Also, once you are in a Hi-Res. screen, to get out and back to 32 characters you must hit the Reset button or type *EXEC &HC000.*

A late update received from Spectrosystems adds to *ADOS'* attraction. The main improvements are: 1) the *CAT* command now prints the granules taken up by each file, 2) the step rate can be individually customized for each separate drive, 3) and incompatibility with PBJ's *Word-Pak* has been rectified.

Overall, I think *ADOS* is well worth the price, whether it is used as a disk utility or burned into an EPROM. I could not find any software that would not run under *ADOS*. The documentation is very clear and the customizing programs easy to use. One disadvantage of using an EPROM is that you may not be able to use the high-speed poke, but I believe you would gain more than you would lose.

(Spectrosystems, 11111 N. Kendall Drive, Suite A108, Miami FL 33176, disk $27.95 plus $2 S/H)

— Dale E. Shell

One-Liner Contest Winner . . .

Lotsa luck with your state lottery when you type in this one-liner to help you pick the winning number. *Lotto Lottery* displays six random two-digit numbers, tests them for being between one and 44 inclusive, tests them for not being repeated, prints the final six numbers, sounds a tone when it is finished and wishes you good luck.

The listing:

```
1 CLS:PRINT@9,"lotto selector":P
RINT:FORI=1TO6:R(I)=0:NEXT:FORK=
1TO6:A=VAL(RIGHT$(STR$(RND(-TIME
R)),2)):IFA>44THENGOTO1ELSEFORI=
1TO6:IFR(I)=A THENGOTO1ELSENEXT:
PRINTA;:R(K)=A:NEXT:PRINT@203,"G
OOD LUCK":SOUND225,10:INPUT"AGAI
N(yORn)";A$:IFA$="Y"THEN1
```

Paul Lansing
Vestal, NY

(For this winning one-liner contest entry, the author has been sent copies of both *The Rainbow Book Of Adventures* and its companion *Rainbow Adventure Tape.*)

Countdown To Fun With *Final Countdown*

Army generals appear to be, as a general rule, a very unstable bunch of fellows. At least that's what they appear to be if you follow their activities in movies and Adventure games. In these scenarios, generals seem to always be wanting to start World War III by firing the first shot at the other guy. Since activities of this nature are frowned upon by most people, usually someone is trying to stop him. Peter Sellers spent the better part of the movie, "Dr. Strangelove" attempting to stop a general from starting 'The Big One.' Now you, with the help of Jarb Software, and your CoCo can attempt to do the same.

Jarb has released a talking version of their *Final Countdown* Adventure. The premise is: A general has started the countdown on a missile aimed at Moscow. Your mission is to stop the general before it is too late. Sounds familiar, doesn't it? However, this Adventure is different in that it *talks* to you while you play it. The general yells his vows of revenge, phones and walkie-talkies give you messages, and the standard Adventure game responses: "You can't go that way," "O.K. you have it," etc, are spoken through the TV speaker as the Adventure progresses. This is the first Adventure game, I know of, to use the capabilities of the Votrax SC-01 speech synthesizer contained in many of the voice cartridges currently being sold. Just when I thought non-graphic Adventure programs were getting dull, along comes one that talks.

I consider *Final Countdown* to be of medium difficulty. Typical of Adventure games, you are required to acquire and have something to get something or go somewhere else. The game is a real challenge.

The game holds your attention, progresses in a logical manner and is written using Extended BASIC so if you really get stuck, you can get help by printing out the listing to find the key words or the next step. The screen is divided into two sections; the top shows your current location and status, the lower shows your last few commands so it is easy to recap your recent moves and locations — a nice touch. The game offers different levels of play. The higher the level of play, the fewer the number of moves you are allowed to have to stop the general before the missiles launch. But, the outstanding feature of the game is the use of speech. The capabilities of the Voice-Pak are well-used to add interest and excitement to the Adventure. On the negative side, the game contains no graphics. Your imagination must create the scene. The documentation is sparse. You are left on your own to find out which commands work and there is no way to save a game while in play and later return at the same point.

To play *Final Countdown*, your CoCo must be equipped with at least 32K Extended BASIC, and have a Votrax SC-01 voice cartridge. I used the Spectrum Projects' Voice-Pak with the Del Software *Translate* program included. While this will limit the number of possible users, those who have the proper equipment will really enjoy this Adventure.

(JARB Software, 1636 D Avenue, Suite C, National City, CA 92050, $24.95 32K Extended BASIC and Voice-Pak required.)

— Bruce Rothermel

PARENTS!
GET A KID
HOOKED
ON COMPUTERS

Send for our unique **LOGO STARTER** program. Use it with your 16K Color Computer and Color LOGO from Radio Shack (Cat. No. 26-2722).

Teachers agree: LOGO is the best way to introduce children to computers. Now, with **LOGO STARTER** you won't have to read a book or instruction manual. Just load the **LOGO STARTER** tape.

Your child will draw exciting designs right from the start. You won't waste your time on a lot of tedious typing. And your child will be on the way to computer literacy. $13.95

SPEED READING

Busy executives! Students! Increase your reading speed dramatically.

Best available speed reading program for the CoCo. Reading material appears on the TV screen at the speed you select, training you to read faster. You can even change the speed while reading.

Complete with 6 different text selections. Plus a drill to improve visual span and perception. $17.95

WILD PARTY

A naughty, sexy computer game for 2 to 6 couples. RAINBOW: "Would definitely liven up most parties." (Oct. 83) Write us; we'll send you a copy of the review. $27.95

All programs on cassette tape for 16K Color Computer. Ext'd BASIC not required. Prices include postage (PA resid. add 6%). Send check to Dept. R, P.O. Box 210, Jenkintown, PA 19046.

b & b software

One-Liner Contest Winner . . .

Press any key to change direction of the moving line before it reaches the border. Try to make as many turns as possible. Type in the program and *RUN*.

The listing:

```
0 IFA<>0THENFORA=1TO4:FORB=0TO1:
X=X+A(A):Y=Y+A(A+1):IFPPOINT(X,Y
)=5THENPRINTC;"TURNS":ELSEPSET(X
,Y):IFINKEY$=""THENB=0:NEXT:ELSE
C=C+1:NEXT:NEXT:GOTO0:ELSEIFINKE
Y$=""THENPRINT"CRAM/PRESS KEY":G
OTO0 ELSEPMODE4,1:PCLS:SCREEN1,1
:A(2)=1:A(4)=-1:A=1:GOTO0
```

Harris Allen
Hanover, VA.

(For this winning one-liner contest entry, the author has been sent copies of both *The Rainbow Book Of Adventures* and its companion *Rainbow Adventure Tape.*)

Nomad: A Rolling Companion For CoCo

It's sometimes said that the only difference between men and boys is the size and cost of their toys. Judging from the electronic gear all over my bedroom, it must be true. Two computers, TV sets, a stereo system, tape recorders and numerous radios all get "played with" at one point or another in addition to the more serious uses they are suited for. Part of the fun of doing these reviews is in playing with the new "toys" that CoCo users are likely to find useful. The vast majority of the hardware I get hold of is mainly intended for serious applications (you're more likely to use your printer to write letters than to make dumps of digitized pictures of Barbara Walters), but here's something that seems to be devoted solely to fun. Frank Hogg Laboratory's Nomad is a robot in its simplest form, one which (unlike things like the Heathkit HERO 1 or the Androbot B.O.B.) uses your CoCo as its "brains," and one which doesn't really *do* anything useful. It doesn't try to. All it does is give you the chance to play with your own robot. At $250 it's not exactly a cheap toy (neither is a $1500 8mm camcorder or a $15,000 boat), but then this is hardly in the same league as a radio-controlled tank.

Nomad is very small, about five inches high, seven inches wide and eight inches from front to back. It has only two wheels and a hard plastic foot to keep it balanced. For "eyes" it has a pair of ultrasonic transducers (which work much like the sonar focusing on many Polaroid cameras, but come from a different supplier) sunk deep into a piece of foam which keeps them separated. A 25-foot telephone-type cord connects Nomad to its cartridge, which plugs into the CoCo (for disk systems you will need a Multi-Pak Interface or one of several adapter cables) and is also connected to an AC adapter. It doesn't look much like its distant relatives that you see in the movies, or its closer kin that help make dishwashers or pickup trucks, but it is an actual robot.

One of the most often mentioned robot "applications" is the ability to carry things. Nomad has a small cargo tray on top, and according to the spec sheet the carrying capacity is "in excess of two cans of beer." I first wanted to see if Nomad could carry a video cassette from the TV to my chair, but remembering that the robot's motors might partially erase what was on the tape, I instead tried a flashlight; it fell off because it was too large for the tray. (Maybe it could hold a pair of rabbit ears so that I can adjust them with the joystick.)

Programming Nomad (once you decide to go beyond the demo programs) isn't difficult at all. The machine language driver (which works on any CoCo with at least 16K) adds four new BASIC statements and an intrinsic function to whatever your version of BASIC already has. The NOMAD command tells the robot how far to go, in which direction (forward or back) and how many degrees to turn (clockwise or counterclockwise). NOMAD 10,0 would propel the robot 10 inches forward, while NOMAD 0,90 would make Nomad turn 90 degrees to the right without going anywhere. (Close-order drill will take a while to figure out, even allowing for the lack of arms and hands to hold the rifle.) The RANGE function (it works just like *MEM*) tells you the distance from the front of the robot to the nearest object directly in front, again in inches. Here's a one-liner that does something really neat:

```
10 NOMAD RANGE-10,0:GOTO 10
```

This tells Nomad to move to a point 10 inches from the object; if you move your hand around in front of it, the robot will follow your hand movements (at least front to back). I should point out that these examples came from a leaflet that Frank Hogg is presently sending out to the people who inquire about Nomad.

SPEED and ACCEL change the maximum speed of movement and rate of acceleration, respectively, that Nomad uses in its travels. Finally, NCONV lets you alter the conversion factors used for move and turn rate and ranging system offset and scale. You can then adjust them to match the characteristics of the robot you have, and you can also change the factors to correspond to other units of measurement (centimeters and radians instead of inches and degrees, for instance).

There are several demo programs in BASIC (they require Extended BASIC to run) that put Nomad through its paces. The main demo is the most fun of all, because it lets you both play with the robot and turns it loose (more or less) to run around on its own. One demo even makes an ultrasonic image "map" of the area!

Nomad is based on a precision mechanism that should work fairly accurately; I'm told that the main bug is the mechanical slippage in the gears. If you operate the robot on a carpet (yes, this is one such gadget that does run on the rug) slippage increases. Judicious use of NCONV will help solve the problem, though.

Anyway, in the short time that I've had it here for review, Nomad has been as much fun to play with as anything I've tried since I got my first computer. If you're at all interested in this sort of thing, I'm sure you'll have a ball with it.

(Frank Hogg Laboratory, 770 James St., Suite 215, Syracuse, NY 13203, $250; robot manufactured by Genesis Computer)

— Ed Ellers

QUESTION:Why buy a video game from a
dinky little ad like this?
ANSWER: JUNGLE QUEEN has all 4 high-
res screens(+ 4th screen intermis-
sion),& super sound.This 32k 100% ML
game is just like the arcade!
TAPE-26.95 DISK-29.95/add 2$post&hand
ZOSO SOFTWARE-6606 Skywae Dr.,
Columbus,OH 43229 *PS:Our 1st cust-
omers now will get big brakes later!

Weight And *Speed* Give Good Unit Conversion Practice

Weight and *Speed* are worksheet makers, designed to give practice on changing from one weight or speed unit to another weight or speed unit. These are two separate programs, each having several subroutines which provide the conversion exercises for the worksheets. You must have a printer to use these programs as written.

Both *Weight* and *Speed* are written in identical format. In fact, they have the same line numbering scheme. The only difference between the two programs is the number of routines used for the conversion problems in each program. Both programs assume you have a printer with 66 lines per page for the worksheet format and that you are using the standard printer Baud rate of the Color Computer. If yours is different you must adjust your computer or printer. You are told in the documentation which line keeps track of the number of lines used in the worksheet and you may substitute your top of form code if you have one. The one sheet documentation also explains other important lines you may need to know, such as the range of numbers used in the problems. Both programs are set to use all subroutines, but by changing the two designed lines you can achieve any desired combination of worksheet drills.

At the start of each program you are prompted to ready your printer and continue when ready. Then ENTER the date and the number of worksheets and problems per worksheet you want to a maximum of 60 per sheet. The computer then prints your worksheets using the following format: the top line has the worksheet number, a place for your name, and the date you entered. Each of the rest of the lines on the worksheet is an individual problem. The problems consist of: 1) a problem number, 2) the conversion problem statement (for example, "CHANGE 4278 FPS to MPH"), 3) the problem number with a blank line to enter your calculated value, and 4) the problem number with the actual answer. The answer key formed on the right side of the sheet may be given to the student to check his work or if you are a teacher preparing these problems, to cut off, so that the teacher has an answer key. Each worksheet is randomized, so is theoretically different.

The following conversion routines are used in the *Speed* program: MPH to knots and knots to MPH (MPH-knots), MPH to FPS and FPS to MPH (MPH-FPS). In *Weight*, the following routines can be found: ounces-grains, ounces-drams, ounces-pounds, pounds-long tons, pounds-short tons, pounds-short hundred weight. Other conversion routines could easily be added.

One thing that bothered me was the author's choice of "maximum values." Four-digit MPH, for example, seemed a little impractical to me, but numbers are numbers and they are meant to be practice drills. Besides, you can easily put in your own range of values.

I did find a bug crawling around in the *Weight* program. Lack of a "maximum value" to choose from in one routine created exercises that converted less than one pound to short tons and caused printer havoc due to overspilling of that problem line into the next line. Therefore, if you selected the maximum of 60 problems per sheet, you no longer came out with well formatted single-page worksheets. The author has been notified and the correction has been made for future shipments.

Weight and *Speed* may be useful for teachers, students, or someone interested in becoming more efficient with weight or speed conversions. Extended BASIC is required because some ECB commands are used; however, the programs themselves are less than 4K.

(Shamrock Software, 4382 Norton Road, Radnor, OH 43066, tape $9.95)

— Kenneth D. Peters

WANTED!

Young men and women seeking adventure, excitement and thrill-a-minute action. No experience necessary—just you and your Color Computer. See below:

FOR THE 32K THRILLSEEKER

	TITLE	DISK	CASS.
NEW!	MR. DIG	$27.95	$25.95
NEW!	CANDY CO.	29.95	29.95
NEW!	WILLIE'S WAREHOUSE	29.95	29.95
NEW!	ICE HOCKEY	——	21.95
	ZAXXON	29.95	——
	PROTECTOR II	——	29.95
	DESERT PATROL	——	21.95
	ICEMASTER	——	21.95
	FOODWAR	——	22.95
	WACKY FOOD	——	19.95
	CASHMAN	——	24.95
	CHOPPER STRIKE	——	24.95
	TIME BANDIT	——	24.95

LOTS OF PLAY FOR 16K

TITLE	DISK	CASS.
MOONSHUTTLE	——	$26.95
FROG TREK	16.95	14.95
3-D TIC-TAC-TOE	18.95	16.95

Interested applicants send check or m/o to:

OELRICH PUBLICATIONS, INC.
4040 N. NASHVILLE
CHICAGO, IL 60634
Credit card orders call: 800-621-0105
(In Illinois call: 312-545-9286)
NO SHIPPING CHARGES!!!

BRITISH COLUMBIA

For all your COCO Software
write or call:
"The USER-FRIENDLY Company"

VISA DATAFACT SOFTWARE LTD. master charge
PO Box 5356 Stn. B Victoria, B.C. V8R 6S4
(604) 595-2312

Heroes And Trolls: A Maze Math Adventure

Heroes and Trolls, by Cognitive Development Co., is an enjoyable 32K Extended Color BASIC version of the old-fashioned flashcard for math review. All four math functions (addition, subtraction, multiplication and division) are covered and three degrees of difficulty are offered. You may play against the computer or another player. Play may be handicapped by selecting different math functions and degrees of difficulty for each player.

The game is billed as an Adventure game but seems to me to be a maze game with Adventure-type graphics characters (trolls and dragons). Game play takes place in a Hi-Res artifact graphics maze. Scoring is shown in the top right of the screen while the active player and current math problem are presented at the top left of the screen. The graphics are well done and in such detail that my 10-year-old no-name TV was not able to do them justice. The sound effects are simple but effective in adding to the game.

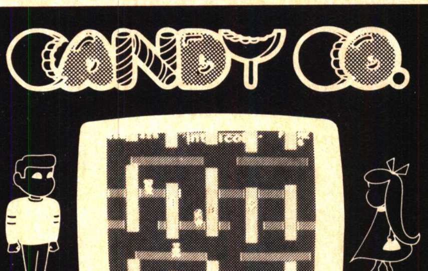
Play proceeds by moving the hero figure through the maze with the arrow keys to free the subject figures, which have been turned to stone by the evil trolls. Invisible trolls and dragons appear to challenge the hero. The challenge is a math problem which must be answered correctly in order to score.

This is a useful game for review of math facts from the level of two-digit addition on up, but I feel that there are some changes that could be made to make this a more useful learning tool. The "random" placement of the game figures on each play of the game is not random but follows a repetitious pattern. This effect of CoCo random number generation has been covered in THE RAINBOW and it is a disappointment to find this fault in a game in this price class. Another problem that should be easy to remedy is the display of incorrect answers. When a wrong answer is given the computer shows the correct answer, but for such a short time that it is hard to see the right answer. I feel a child should have enough time to examine wrong answers so that he may find where he went wrong.

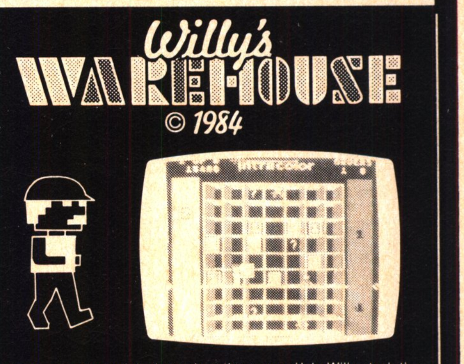
Even though the game has these shortcomings, I feel it is a colorful, enjoyable alternative to old-fashioned flashcards for practice. It may even catch some children by surprise and give them some painless instruction.

(Cognitive Development Co., Suite 141, 12345 Lake City Way NE, Seattle, WA 98125, tape/disk $29.95)

— Charles Bream



intracolor
Grand Prix



Setting The Standards

Graphics and sound effects like never before on the CoCo. An exciting original arcade action game. Control your hero through a maze of moving conveyor belts. Outsmart bad guys and save Q.P. Doll. Over 1,000 frames of increasing difficulty.

100% ML, original title screen music, 1 or 2 players, colorful Hi Res graphics, exciting sound effects, joystick or keyboard input, pause feature, 8 digit scores and high score name entry. For **32K** CoCo and TDP-100.

Cassette-34.95 **Disk-34.95**

Strap yourself into the ultra responsive Formula I car and rev the throttle to fire 500 screaming horses to life. Your heart pounds in anticipation of the race. The green flag drops and you are slammed back into your seat as the field thunders off in a deafening roar.

An exciting racing game in colorful Hi Res graphics with realistic sound effects. Joystick or keyboard input. Joystick input is compatible with all joysticks. Many different tracks to choose from. For **32K** CoCo and TDP-100.

Cassette-34.95 **Disk-34.95**

Another exciting original arcade action game. Help Willy stock the warehouse while keeping up with incoming orders. Watch out for the antagonists who intend to make your day long.

Excellent graphics and sound effects. 100% ML, 1 or 2 players, demonstration mode, selectable difficulty, joystick or keyboard input, pause feature and high score list with name entry. For **32K** CoCo and TDP-100

Cassette-34.95 **Disk-34.95**

COLORPEDE

RAINBOW CERTIFICATION SEAL

This truly outstanding engineer designed, 100% ML game with multi-colored Hi Res characters and fast action will challenge the most avid arcade buff. 1 or 2 players with joysticks or keyboard. **COLORPEDE** slithers through the toad stools. Demonstration mode with top 5 scores. Pause feature. For **16K** CoCo and TDP-100.

Casssette-29.95 **Disk-34.95**

". . . forefront of the pack . . ." **RAINBOW**, Dec. '82

ROBOTTACK

You are the super human who must fight off the attacking robots and save the remaining humans from destruction. You have super human powers, can shoot in any direction and move anywhere on the screen to accomplish your vital mission.

Engineer designed, 1 or 2 players and top 5 scores displayed. Pause feature. For **16K** CoCo and TDP-100 with joysticks.

Cassette-24.95 **Disk-27.95**

AT YOUR DEALERS NOW.
From **INTRACOLOR:** VISA, MASTERCARD, Money Order. Please allow 2 weeks for checks. Add 1.50 for shipping, 3.00 outside U.S. 4% tax in MI.

intracolor
P.O. Box 1035, East Lansing, MI 48823 (517) 351-8537

DEALER INQUIRIES INVITED **QUALITY PROGRAMS SOLICITED**

Coins and *Addition* — An Educational Plus

Coins and *Addition* are two educational programs for the Color Computer. Supplied on cassette, these programs require a 16K Color Computer with Extended BASIC. *Coins* is probably intended for use by children ages five to nine (this is my estimate; the instructions did not state a range). *Addition,* according to the author, is intended for use in elementary and special education classes. Both are described below.

Coins offers the student a choice of three activities:

1) determining the value of a combination of coins
2) combining coins to equal a particular value
3) determining the change resulting from a transaction

Each of these activities can be performed at one of three levels — easy, medium, or hard.

The display is a graphics screen "billboard," displaying rows for pennies, nickels, dimes, and quarters. The student chooses a coin by pressing the key corresponding to the first letter of the coin's name — 'P' for penny, 'N' for nickel, etc.

Unique symbols are placed in each row to indicate the number of coins selected. Both visual and audio effects indicate a correct or incorrect response. (If incorrect, the student must repeat the problem.) At the conclusion of the activity, the student is shown a "report card," indicating both the number of questions answered correctly and incorrectly, and the percentage of correct responses.

The menus and graphics are simple, but well-done and attractive. The single-page instructions are complete and easily read.

Addition presents the student with addition problems at any of eight selectable levels of difficulty. The first four levels do not require a "carry" digit; the last four do. The student initially selects a level of difficulty; the computer adjusts the level according to the student's responses.

The addition problems are shown on the left half of the screen in large numerals, using a vertical format — addends are placed over each other, and the sum is entered below a horizontal line under the two addends. "Carry" digits, when required, are entered just as they would be if doing the problem with pencil and paper.

After the student solves a problem and presses the ENTER key, the computer checks the student's response. If correct, the student is given the choice of another problem, or ending the session. If incorrect, the computer displays the correct answer on the right half of the screen, and flashes in red the digits the student added incorrectly.

At the conclusion of the program, the student is given a detailed summary of his responses. The number of correct and incorrect responses at each level is shown, as is the starting level, the final level, and the level of best performance. If a printer is connected to the computer, the student may request a printout of his summary.

The two-page instructions are complete and both programs performed well. My two younger children, ages five and nine, found them challenging and interesting. (My nine-year-old wanted to summon her friends to have a neighborhood arithmetic contest; my five-year-old worked diligently with *Coins.*) I'd consider these programs a good investment.

(Wish Software, P.O. Box 7366, Johnston, RI 02919, $24.95, plus $1 S/H)

— Jerry Oefelein

Hint . . .

Which Computer Is Which?

Here is a short listing that is very handy when using the *Superpatched EDTASM+* that Roger Schrag has given us for either Disk 1.0 and Disk 1.1 ROMs. It is also a good example of a minor bug that I found in the Extended BASIC *RENUM* command described below.

Note Line 9 *(RUN 4).* If you *RENUM* this program this line does not change to the new line. (You get *90 RUN 4* instead of *90 RUN 40.*) This is similar to *GOTO* type *RENUM* (as in Line 3 and implied in Line 5), but is not supported by the Extended BASIC. So beware of *RENUMbering RUN*-type statements.

The listing:

```
1 'THIS PROGRAM LOADS THE APPROPRI
ATE SUPER PATCHED EDTASM+(SEE DEC 82,
APR 83, AND SEPT 83 RAINBOWS) FROM DISK
DEPENDING ON WHICH DISK ROM IS PRES
ENTLY BEING USED. I STORED THE FINAL
PATCHED PROGRAMS AS "EA" FOR DISK 1.0
AND "EA2" FOR DISK 1.1.
2 'JUST USE ** RUN"EA" ** WHENEVER YOU
WANT TO USE THE PATCHED EDTASM AND
YOU DO NOT HAVE TO WORRY ABOUT THE
DISK ROM.
3 GOTO 8
4 A=&HCF7E'AREA OF DISK1.1 ROUTINE
5 IF PEEK(A)=198 AND PEEK(A+1)=95 THEN 6
ELSE 7'CHECK FOR 1.0 ROM
6 LOADM"EA":EXEC
7 LOADM"EA2":EXEC
8 PCLEAR8
9 RUN4
```

John Kelty
Lincoln, NE

RAINBOWfest
Chicago
May 17-19

Blackjack Royale Version 2.0 Is A Royal Blackjack Trainer

Blackjack Royale, Version 2.0 is a new version of a program which I reviewed a year ago (August 1983). The present program has been made more playable and faster. This is probably the best training aid for learning winning techniques of blackjack available for the Color Computer! It is a very fine program which I enjoyed reviewing.

Blackjack is interesting to the person who likes to gamble. It is the only game where it is possible to beat the casinos on a consistent basis. But I only said it is possible to beat them. Few people can get the advantage over the house. You do not build multi-million dollar gaudy buildings with winners, but with losers. Using *Blackjack Royale* and one of the good books on blackjack, you will learn to win. While you may become a winning player, remember the true mark of a consistent winner at games of "chance" is that money that is really needed for life support is never used to play a game. The only thing that is certain in such games is that you will also lose on occasion — even at a game wherein you have the advantage. The long term winner plans for this to happen. If I ever find a sure-fire, no-lose method of beating the house all of the time, I would not tell you about it and neither would anyone else. The statement in the booklet that it is possible to get a five percent advantage is very misleading. While there are a very few cases where the advantage is this high for a second or two, the average advantage is about 1.5 percent for a good counter. Only the very best can get about 1.8 percent. If I could ever get five percent on the average, I would quit work, play blackjack all of the time, and get very rich (if I don't get shot first).

Several good books were listed in the nice booklet which comes with the program. To these I would add Wong's *Professional Blackjack*, which is probably the best general book on blackjack.

The most beautiful part of *Blackjack Royale* is the graphics. My wife and kids liked the funny faces on the face cards. There is also considerable value in these graphics. They use only one suit in this game (diamonds) but suits have no meaning in the modern version of blackjack. The graphics give the feel of a real card deck. This is what you need to practice the "card counting" methods which make you a winner. (Card counting is the name given to the process of remembering the value of cards played in order to modify betting and playing procedures.) This new version of *Blackjack Royale* uses a rapid card generation subprogram which is a nice change from the original.

In order to get the feel of card counting in a real casino, I would suggest one change in the BASIC program. As the program now exists, the player must hit a key after the hand to start a new hand. In actual play, the cards are picked up as soon as possible to allow a new hand to be played. This means more money for the house. If you replace Line 740 with the following, the cards will be taken up after a brief pause:

```
740 FOR ZZ = 1 TO 2000:NEXT ZZ
```

As you get better, lower the 2000 number. You should be able to keep a correct count down to at least 400 if you are going to win against a fast dealer.

Another nice feature of *Blackjack Royale* is that it allows you to set any value on a card in your test of card counting systems. The most common method-counting sets the value of aces and 10 cards (ten, jack, queen, and king) to minus one and the low cards (two to six) to plus one as they are removed from the deck. As the running total gets more positive, your advantage goes up and the house advantage goes up as the count goes down. The old version of this program used this system as the default but the new version makes you set in your own system. The use of the -1/+1 system is not copyrighted because of the years of use in mathematics literature. The authors could have used it in their program if they wished to.

There were several minor mistakes (bugs) in the earlier edition of this program. These were pointed out in the first review. I guess the author did not read it, because only one of them was fixed in this edition.

The most serious error in the first program was the fact that the count did not reset when the cards were shuffled. This has been fixed and it works fine. The input of data into the bet or the card count value still must be done with care or the computer will misread it.

There are three blackjack rules which are used incorrectly in both versions of this program. The surrender option is still incorrect. Do not use this option. A surrender is supposed to have both the dealer and the player get a new hand after half of the player's money is taken. This program forces the player to get new cards while the dealer keeps his cards.

Other rules which have errors are the resplit of pairs which the computer cheats at and the double after splitting pairs which doubles both of the hands instead of only one.

Blackjack Royale, Version 2.0 is an excellent program, and it should be bought by anyone who wishes to learn to play winning blackjack.

(Spectrum Projects, P.O. Box 21272, Woodhaven NY 11421, or P.O. Box 9866, San Jose, CA 95157-0866, 32K tape/disk $24.95)

— Thomas C. Roginski, Ph.D.

One-Liner Contest Winner . . .

Here's a one-liner that will draw colorful random pictures. Select U, L, D, U, E, F, G, H in any order and amount (one through nine), and watch the CoCo draw. Just type in the program and *RUN*.

The listing:

```
0 CLS:LINEINPUT"TYPE(U,L,D,U,E,F
,G,H) IN ANY ORDER AND AMOUNT-PR
ESS ANY KEY TO CONTINUE:";A$:PMO
DE4:PCLS:SCREEN1,1:FORA=0TO3:FOR
S=1TO62STEP2:B$="BM126,94"+"A"+S
TR$(A)+"S"+STR$(S)+A$:DRAWB$:NEX
TS,A:FORA=0TO1STEP0:IFINKEY$=""T
HENNEXTELSE0
```

Michael Keefe
Philadelphia, PA

(For this winning one-liner contest entry, the author has been sent copies of both *The Rainbow Book Of Adventures* and its companion *Rainbow Adventure Tape*.)

Graphic Compression Utility — Three Programs Rolled Into One

This software package contains three utilities that all work toward compressing, decompressing or relocating graphics screen data.

To get an idea of what compression is all about, try to imagine a graphics screen from one of your favorite space arcade games. There will be the black space background with many little white dots for stars and a few spaceships. Many of the adjoining bytes that make up the picture will be identical, such as the byte value zero that will produce a black line eight pixels across for the space background. By checking and cataloging for repetitive byte values, compressing a picture like this could result in cutting the memory required to store it in RAM or disk to about 30 percent of the original space. In other words, a *PMODE 4* Hi-Res screen normally uses 6144 bytes, but when compressed will only take up approximately 2100 bytes.

Not all screens will save this much memory however. The more complex the picture, the less memory will be saved through compression, but on an average you can expect a 15 percent to 60 percent reduction factor.

The
ORACLE II
NEW
The Ultimate CoCo Monitor.

The ORACLE II is not a rehashed monitor program adapted to the CoCo, but a state of the art monitor designed to compliment the CoCo and its unique abilities.

Compare some of our features:
- 64K Compatible - the ORACLE II can relocate itself and its monitor screen above disk basic.
- Single Stepper - a single variable speed stepper that allows you to step both rom and ram.
- Disassembler -
- Graphics Support - allows you to step a program while watching any graphic screen, in any graphic mode, and toggle between the monitor screen and back, with one key.
- ASCII/hex search-up to a 10 byte search.
- Full screen display and editing of memory.
- Over 40 commands.

CoCo disk or tape (both versions included)	$35.95
Spectral or FHL Flex version	45.95

(+ $2.00 shipping and handling)

RAINBOW CERTIFICATION SEAL

MICRO MAGIC
P.O. BOX 142, SUMNER, WA 98390
(206) 863-8762
(24 Hours)
master charge
VISA

The first program is called *Graphic Compression Utility* or *GCU* (not to be confused with a program with the same initials from Computize) and is menu-driven for easy operation. It allows you to load and view a Hi-Res screen from disk and choose to compress it or not. If you do compress it, a new disk file under the same name will be saved but with a special extension for identification.

After the compression has been completed (about a 10-second process) a text screen will show you how many bytes the original screen was, how many it has been compressed down to and how many bytes have been saved.

Some graphics screens have such complex designs that not much if any memory savings will result through compression and the program will tell you so.

The user has the choice of determining what portion of the graphics screen is to be compressed by using a simple line cursor to delimit your screen. This is ideal if you want to use the upper screen for pictures and the lower half for text such as in Adventure games.

The second program in this package is *Graphic Decompression Utility (GDU)* that as its name implies, takes compressed graphics files from anywhere in memory and blows them back up to their original size with no loss of detail. This program is a module called by BASIC's *USR* command or through a machine language program. This module is relocatable and takes up only 300 bytes of overhead, which is really insignificant when you add up all the graphics bytes it will save by compression.

The third program is called *Graphic Relocation Utility (GRU)* and it loads in picture files from disk, tells you what address they start at and prompts you for a new start location. It relocates itself before you can take your finger off the ENTER key and is ready to do another.

Only *PMODE 4* is supported but that's no problem since this graphics mode is now the standard for CoCo graphics when employed with artifact colors. The program is not copy protected and comes on disk, but once the graphics have been compressed they can be saved to and loaded from tape (but no instructions are given for doing this).

A demo program is included to supplement the documentation, which consists of five pages of instructions. Instructions are also available from within the program itself that will let you jump in right away.

The documentation is sufficient but does not take the user by the hand through all the aspects like utility programs should. A good working knowledge of BASIC programming, *USR* calls and the CoCo memory map are required to really get the most out of the program with a minimum of learning overhead time. Novice programmers may get a little snowed by not fully understanding what is going on from the start, but will catch on before long.

I would recommend this program to anyone who does a lot of graphics programming and wants to achieve some remarkable results using an absolute minimum of memory for graphics data storage.

(LP Seymour Services, 937 Fairwood Ave., Sunnyvale, CA 94089, disk $27.95, plus $3 S/H)

— J. Michael Nowicki

Letting CoCo Do Two Things At Once With *Super Spooler*

Well, what's this on my table? It's a spooler called *Super Spooler* from THE RAINBOW to review. The documentation seems really complete. It is tape and disk versions — 32K and 64K (although they say it will work with any size memory).

Do you know what a spooler is? A spooler, in this case a print spooler, is a device which intercepts characters to be printed and stores them in a buffer. Then, one character at a time, it prints out a character to the printer, giving you control of the computer at the same time. In other words, you can be printing one thing, and using the computer at the same time. This is why any spooler would be a valuable addition to a software library (if you own a printer of course!). Think about it — writing a program while your mailing list or a letter is being printed at the same time.

I turn on my trusty 32K CoCo. For the 32K version, you just clear some memory, *LOADM "SS32K/BIN"* and *EXEC*. It worked! Now I can load in my own program and *LLIST*. Buffer Overflow! One drawback is that 32K sure can't hold a lot. However, Tandar Software does recommend that you use a 64K Color Computer, and the documentation says I can expand the buffer to make it bigger, but it doesn't say how. Well, I sure am glad I also have a 64K CoCo.

The 64K version works nicely and has a large print buffer. The instructions say I can use this with *Telewriter-64,* as well as other word processors, and it works fine with *Disk Scripsit.* It really prints out smoothly on the DMP-400 (a Radio Shack printer), but the good thing is they say that it can work on all printers too! The manual also contains a compatability chart, a quick reference sheet, a memory map and for $5 extra, you can get the fully commented assembler source code. I think this is a great idea for programmers who wish to learn how a spooler works.

They also have a return policy which is very good. Just send it back and a new copy will be shipped.

A registration sheet is also included in this package. Once you register your copy of *Super Spooler,* you will receive catalogs and news about other Tandar products. Also, you can get my favorite seven letter word — support!

Super Spooler is a fine utility for anyone with a printer and 64K. Although the company states that the program will work with all memory sizes, 32K (or less) owners should think twice before buying it because of the small buffer capacity. Congratulations to Tandar Software on a fine offering!

(Tandar Software, 12 Araman Court, Agincourt, Ontario M1T 2P6, $19.95 tape and disk (U.S.), $24.95 tape and disk (Canada))

— Sandy and Barry Smith

Androne — A Fun Way To Zap Bugs

As all of us who have tried to write our own programs on the CoCo know, there are dozens of tiny bugs hiding in our 16 or 64K of RAM. They sit there waiting and then pop out at you, hitting you with "SN Error." How often we have wished for a handy phaser to just zap them out of our lives. Being the thoughtful company that it is, Radio Shack has given us the chance to do just that with its new program pack, *Androne.*

In the game, you are *Androne,* the terminator, searching each byte of memory for "data bugs." Be warned that data bugs attack *Androne* whenever they see him. Each attack drains *Androne* of energy. Go down to zero energy, and it's all over. There are power units at each level to recharge yourself so you have at least a fighting chance.

The display shows the room you are in as well as your line of sight in the direction you are facing. The room graphics are 3-D and are similar to *Dungeons of Daggorath.* Data bugs appear as eliptical faces that zoom in and out as they attack you. I really like the effect as you get hit by data bugs. As they hit you, the whole world shakes with their powerful blow. Power units are hour-glass shaped. The screen also shows a mini map of your level, a power gauge, a direction indicator, and your score. The power gauge shows how much power you have left before the end.

The game is played with the left joystick. It controls your movement through the maze as well as your shooting. To shoot, you push and hold the fire button while using the stick to position cross hairs on the data bugs. The maze has "pressure" steps that dissappear as you step on them. This makes finding your way around much easier as you can always tell if you have been there before. Points are awarded for killing data bugs, stepping on steps, and getting power units. The point values go up as the level of the game goes up.

I found *Androne* to be quickly understood but not easily mastered. Out of the seven levels, the highest I could play was level four. The joystick is very responsive; almost too much at times. I found that, like *Skeet,* you must lead your targets. The only flaw with the controls is that you cannot jump backward. Instead, you must turn around and then move.

Androne is an enjoyable game for those of us who don't often make the "Scoreboard" section in RAINBOW. The arcade masters should try it first to see if it is too easy for them. Dr. Megabyte prescribes it as an excellent game for the new CoCo owner. It gives a good look at the graphics and sound that the CoCo can do without being too hard to understand. It's also not so easy that playing it a few times will make it boring. The doctor takes his hat off to Mr. Arnstein (the author) and to Tandy for giving us a mid-level game of high quality. If you are like me, and are not one of the arcade masters, you will like this one.

(Radio Shack stores nationwide, cat. no. 26-3096, $19.95 program pack, 16K standard minimum)

— Mark E. Sunderlin

Fly Away With Kay, The *Spelling Bee*

Crystal Software has introduced an educational word game of the highest caliber. Kay, the *Spelling Bee*, is a high resolution animated graphics word game for one or two players which requires 16K Extended BASIC. It comes with a file of 260 words covering two skill levels and three game variations. It is also possible to create additional word files which can be saved to tape.

The object of the game is to help a cute little bee named Kay find the letters that make up the word hidden in a flower. Player(s) input letters using the keyboard. Each correct guess results in the letter appearing in all applicable blank spaces. Each incorrect guess fills one of eight beehives with the wrong letter. Your reward for finding the right word is a musical celebration and a smiling flower. Once a word is found, it will not be repeated during the session. If after eight incorrect guesses, you cannot figure out the word, the correct word is displayed on the screen.

After *CLOADing* and *RUNning*, the game menu appears. Make sure the PLAY button is depressed because the word file will not be loaded unless needed. Game option #1 is a one player game in which the computer selects a word at random and challenges the player to guess the word. Game option #2 is a two players against the computer format. Players take turns trying to be the first to discover the word. A scoring system makes this option highly competitive. Option #3 allows players to take turns entering a word for the other player to solve. The same scoring as in option #2 applies.

One of the really good things about this game is that with the ability to create word files the limits are endless. Although advertised for ages seven to adult, I found that seven-year-olds might have trouble with the existing word file. The ability to create a file more suited to their level is most welcomed, since the youngster should have no trouble with the mechanics of playing the game. Creating a word file is one of the options in the main menu.

I have nothing but praise for Crystal Software's effort to bring quality educational programs to the marketplace. *Spelling Bee* is an excellent word game for use at home or in school. The animated graphics are very well done and will bring delight to the most critical of players. This is a game that should be part of every user's educational software library.

(Crystal Software, 6591 Dawsey Road, Rock Creek, OH 44084, tape $15.95)

— Stephanie Snyder

CINSOFT
For COCO. . . in the Midwest
PROGRAMS • PERIPHERALS • SUPPLIES • SERVICE
Since 1982 ....Now in our 3rd year

Free gift with any order placed on our exclusive "Electronic Shopping Service"

• Call •
513-396-SOFT
VISA MasterCard

• Write •
2235 Losantiville
Cincinnati, OH. 45237

• Shop by Modem •
513-396-SHOP
AMERICAN EXPRESS COD

SHIPPING will be charged at our ACTUAL COST
Ohio residents add 5.5% Sales Tax COD add 2.00

PROGRAMS

Buy	Save
1	10%
2	15%
3	20%

Thru Dec. 15, 1984

VIP Writer	69.95
VIP Terminal	49.95
VIP Database	59.95
Elite Calc	59.95
Elite File	74.50
Dynacalc	99.95
Musica II	39.95
Graphicom	29.95
Deft Pascal Workbench	119.95
Tom Mix, Mark Data	Call

MODEMS

Volksmodem with cable	79.95
Hayes Smartmodem 300	239.00
Hayes Smartmodem 1200	549.00
Promodem 1200	399.00
Cable for Hayes or Promodem	14.95

DISKETTES

5 1/4" SS/DD

Ultra Magnetic	19.00
BASF	21.00
3M	23.00
Maxell	25.00

5 1/4" DS/DD

BASF	25.00
3M	27.50

PRINTERS

Gemini 10X	279.00
with Metric Industries interface	329.00
with pbh interface	359.00
Delta 10	399.00
Power Type, daisywheel	379.00
Serial Cable for Power Type or Delta 10	14.95

star

AUTHORIZED STAR-MICRONICS
★ SERVICE CENTER ★
We will gladly perform any warranty or out-of-warranty service on your Star printer.

MONITORS

Gorilla green	99.00
NAP green (with sound!)	109.00
Sakata green	109.00
Sakata color	269.00
Videoplus	24.95
Videoplus IIM	26.95
Videoplus IIC	39.95
Mark Data Video Driver	29.95

Order Today!

Preparing Your Income Tax Form With *TAXAID*

The preparation of our annual income tax returns is a form of involuntary servitude not abolished with the other slavery in 1865. A program which would help us keep our accounts and papers straight for this ordeal would greatly help. *TAXAID* is not that program.

It would be unfair to focus on the mere formal shortcomings of this package, except that they are so symptomatic. The author cannot spell ("royality" and "recieve" are two samples, one of which turns up on the printouts), and the layout of his text on the screen is abysmally sloven. What *TAXAID* amounts to is a series of BASIC programs or modules which establish three ".DAT" files from which printouts are made. Each of the modules must be accessed by the user from the directory (in the disk version); there is no attempt at a menu, although each program ends by re-invoking the root module as if a menu were resident there.

TAXAID's purpose is to prepare and print federal schedules A, B, C, E, F, G and child and dependent care for inclusion with your 1040; it also calculates data for Form 1040 and prints it by line number. You are required to compute such things as casualty loss (here spelled "casuality") and capital gains beforehand. Did you think that was what the computer was for? Well, you were wrong.

Even the printouts are formatted in a casual manner at best, user input appearing substantially where chance places it. And most of the modules won't run at all if you have no printer on line.

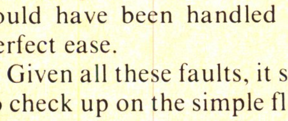
And it is all *slow,* and slower when you have to hit BREAK and readjust the printer between forms — a matter which could have been handled from inside the program with perfect ease.

Given all these faults, it seemed pointless to this reviewer to check up on the simple floating-point arithmetic which is the most the program is expected to do.

The most attractive feature of *TAXAID* is its price — but you get what you pay for, after all.

(Alpha Byte, 1008 Alton Circle, Florence, SC 29501, 16K or 32K cassette $19.95, disk $24.95, plus $1.50 S/H)

— R. W. Odlin

GRAPHICS COMPRESSION
GRAPHICS COMPRESSION UTILITY (GCU)
DOUBLE OR TRIPLE THE AMOUNT OF GRAPHICS THAT YOU CAN STORE IN RAM OR DISK*. INSTANTLY DECOMPRESS YOUR GRAPHICS FOR HI REZ DISPLAY WITH THE RELOCATABLE MACHINE CODE "GRAPHICS DECOMPRESSION UTILITY" (GDU) THAT CAN BE CALLED FROM BASIC**. ALL MACHINE CODE, MENU DRIVEN AND USER FRIENDLY. USE THE RELOCATABLE COMPRESSED GRAPHICS FOR EITHER DISK OR TAPE ORIENTED PROGRAMS. 32K, DISK & ECB REQUIRED FOR ROM CALLS. $27.95 + $3 S&H *VARIES WITH COMPLEXITY

RAINBOW CERTIFICATION SEAL
6144 bytes COMPRESSED TO 1542 bytes
LP SEYMOUR SVS 937 FAIRWOOD AVE SUNNYVALE CA 94089. **purchasing "GCU" grants you license to use "GDU" for any purpose

Video Reverser Is Easy To Install

When I first saw the CoCo back in 1980, I couldn't figure out why the text display was done in black letters on a green background with a black border. Quite a few CoCo users have, I gathered, wanted to change this. Sometimes it's done in software, sometimes in hardware. The Dynamic Electronics Video Reverser is a good example of the hardware approach.

The Video Reverser is simply a single chip that connects to the 6847 video generator in the CoCo. One pin of the 6847 controls whether normal or inverse video is used; the video Reverser feeds it exactly the opposite of the signal coming from the microprocessor. One of the three available models does only that; the other two have a switch that selects normal CoCo operation, inverted characters or a third mode that displays all characters including lowercase as green letters on a dark background. The Video Reverser works on any CoCo, including the TDP System 100; I expect it will also work on the Dragon and the MC-10, though I haven't tried it. On the MC-10 and a very few early CoCos you will have to unsolder the 6847 from the board.

As I said, there are three different versions of the Video Reverser. The VR-1, which is intended for the D and E board CoCos, has four leads coming out of the chip with tiny eyelets on the ends. You have to unplug the 6847, bend one of its pins up, attach one lead to that pin and the others to three other pins, then plug the 6847 back in. This is a very ticklish job, and when I tried to install our first sample one of the eyelets broke off. On the NC board and the CoCo 2 you can use the VR-1M, which is a module that plugs in between the 6847 and the main board. This version is slightly more expensive, but may save you some time and aggravation. I don't think it will work well on the D or E board models because of the RFI shield over the 6847; the module raises the chip about ¼". The VR-2 is the same as the 1M, but doesn't have the switch and, therefore, inverts at all times.

Before you take the plunge and put in something like this, you should know that the CoCo's text display when inverted in this manner consists of light green characters on a dark green (not black) background. This is because the color "difference" signals that tell the encoder to color the active area green stay on whether the point in question is light or dark. In normal CoCo operation this only makes the characters a bit fuzzy in many cases, but when you invert the text display you get a rather odd-looking screen. This is true no matter how you invert the display, and is not the fault of the Video Reverser. One thing I don't like about the product is that the IC's type number has been blacked out. When I buy something I feel I have a right to know what's in it.

If you think reversed video would be a worthwhile improvement, the Dynamic Video Reverser is a good way to get the job done. I'd suggest the deluxe VR-1 series over the VR-2 simply because of the added flexibility.

(Dynamic Electronics, Box 896, Hartselle, AL 35640; VR-1 $19.95, VR-1M $24.95, VR-2 $19.95)

— Ed Ellers

SP-2: Improved Serial Interface At A Good Price

The SP-2 Serial Interface does not have anything to do with Rice Krispies or Captain Crunch.

What it *does* do is allow your CoCo and the popular Epson printers to "shake hands" and get some work done, rather than just sitting there and staring at each other.

Your CoCo feeds information to a printer one bit at a time. Most printers, including Epson, are designed to take information several bits at a time, in parallel fashion. Therefore, you need something which can translate for your CoCo, and that's where the SP-2 comes in.

An improved version of the SP-1 was reviewed in the June 1983 issue of THE RAINBOW. The SP-2 is designed for the MX-80, MX-100, FX-80 and RX-80, and also works with Graftrax-80 and Graftrax-Plus (MX-80 options). It features an increased range of Baud rates (300-9600 for BASIC, 19200 for machine language) and an improved oscillator requiring no adjustments.

The SP-2 allows you to access all the type fonts and graphics modes that your Epson printer has and will probably decrease the time you spend waiting on it to finish printing. A large number of peripherals accept data at a speed of 600 Baud, the rate at which Epson printers are set at power on. However, you can speed up your operation considerably by increasing the Baud rate. How much? A full page on the MX-80 takes approximately three minutes to print at 600 Baud, with each line of print taking about two seconds to feed into the printer. A full page at 9600 Baud takes only 1½ minutes, or half the time. On a 10-page paper, form letters, mailing lists or screen dumps, you better believe that makes a lot of difference! Apparently not all CoCos can operate at 9600 Baud, but anything above 600 will make things go a lot faster. The selectable range of the SP-2 allows you to choose the fastest speed suitable to your CoCo and your particular application.

The illustrated instructions are among the clearest and most complete I have seen for hardware. If you follow them step by step, you should encounter no problems. All you have to do for most CoCos is open the printer, carefully plug in the board, tighten the screws, set one DIP switch, close the printer, and *POKE* as necessary. If you happen to have an early CoCo model which uses 7-bit ASCII code, all you have to do is flip one other DIP switch and you're set. If you don't know which yours is, *EXEC 41175*. If the screen says "COLOR BASIC 1.0," you've got a 7-bit machine.

The SP-2 cable is permanently attached to the board (no connector) but that's no problem for most of us. You may wish to invest an extra five dollars for an external switch. This will allow you to use the printer's parallel port without removing the interface board, as well as permitting you to change Baud rates without opening the printer. Once the switch is set the Baud rate stays the same, though if you are using anything other than 600 Baud, you must *POKE* the right value into the computer each time you turn it on, since the printer powers up at 600 Baud.

Detailed technical information and a parts list are included. The SP-2 will work with no parity bit and at least one stop bit, a parity bit and at least two stop bits, or even with a parity bit and only one stop bit. For $10 extra, you can buy a true RS-232 version.

Two years ago I paid about $80 for an MX-80 interface that had very limited Baud rates and did not permit me to use the "dot graphics" and thus screen dumps — I would have had to shell out another $70 for that privilege. In addition, I had to provide my own cable — which meant about $20 more. The SP-2 provides its own cable, permits a full Baud range and allows full access to all printer graphics for half the price. Check it out — I think you'll agree it's a good deal.

(CNR Engineering, P.O. Box 492, Piscataway, NJ 08854, $49.95)

— Warren S. Napier

YOUR TRS-80* SPECIALISTS IN CANADA

COCO SOFTWARE FROM

ADVENTURE INTERNATIONAL
COMPUTERWARE
PRICKLEY PEAR
COGNITEC
EIGEN
MICHTRON
TOM MIX
SPECTRAL
SILVERWARE
SOFTLAW
MARK DATA
SKYLINE

ACCESSORIES

PRINTERS
BOTEK INTERFACES
MODEMS
JOYSTICKS
SUPER PRO KEYBOARDS
EAP GOLD CONNECTORS
BOOKS, MAGAZINES
AND MORE

WE HAVE BEEN SERVING TRS-80* USERS FOR 3 YEARS WITH THE LARGEST SELECTION OF SOFTWARE AND ACCESSORIES AVAILABLE IN CANADA.

WRITE OR PHONE FOR A FREE CATALOGUE
MASTERCARD AND VISA ACCEPTED

CMD MICRO COMPUTER SERVICES LTD.
10447 124 ST. EDMONTON
ALBERTA T5N 1R7
PHONE: 403 488-7109

*TRS-80 is a trademark of Tandy Corp.

SWITCHABLE DOS IS HERE!

No Traces To Cut — No Soldering
Uses J&M **OR** RS Disk Controller,
JDOS **AND** RS DOS at your fingertips.
*DOS's not included.

DOS Switches $39.95 plus $2.50 S/H
(WA Res. Add 7.8% sales tax)

Multi Venture

Multi-Venture
P.O. Box 6157
Alderwood Manor, Wa.
98036

Christmas Quiz — Excellent, Religious Learning Tool

If you want to do some early Christmas shopping this year, put *Christmas Quiz* by Quality Christian Software on the top of your list. In fact, buy it now so you will be ready later.

The good folks at Quality Christian Software are out to prove the first part of their name is no quirk. *Christmas Quiz* is an excellent religious learning tool, as are the other members of the QCS family of programs. It is written in BASIC and can be modified if desired, but it is just fine as it is.

The documentation is one printed sheet, but that is all you need, as the instructions on the program menus are more than sufficient to meet the operator's needs.

This program has one goal of "keeping Jesus the central focus of Christmas." That goal is achieved through a series of questions designed to expose the biblical view of Christmas, as opposed to legendary and folk views of the nativity.

I saw it not only as a tool for Sunday school, family study or Bible quiz teams, but a place for adult study groups to kick off some mighty important and informative fellowship sessions.

As an example, one question asks the number of wise men who came to visit the Lord. The number of Magi is never stated in the Bible (although three gifts are mentioned) so the question brings you to that point with scriptural reference. There is no great philosophical importance in that other than a more intimate knowledge of the scripture.

The program could be used for competition or for drill. It returns a report of the number of questions answered correctly, a percentage score of that, and how the person rates against previous entries in the round. It also reports the total time used and the best time used so far in the round.

QCS permits you to set the time alloted for your response to each question from one to 5000. My Mickey Mouse watch said one was about 1.1 seconds and 5000 was three minutes, 19.9 seconds. This would permit the game to be used by very young groups with the advisor possibly operating the computer board and helping the children. A correct answer gets a bright little ditty while an incorrect response gets a "zonk."

That's not the best of it. You are greeted by "The First Noel" when you *CLOAD* the program and when you decide to stop playing you get another Christmas surprise.

The documentation warns 16K users to *PCLEAR 1* before using, and QCS documentation has always been straightforward, so you had better do it!

I found no program or operational defects in the tape. It loaded with no problem whatsoever.

Christmas Quiz is a year-round pleasure. It should be a welcome addition to your library, which we hope will become larger and larger because QCS is publishing new programs.

(Quality Christian Software, P.O. Box 1899, Duncan, OK 73533, $9.99)

— Howard L. Ball

UPGRADE NOW!

Unleash the power of your Color Computer!
Sale Packages for every need

	SALE
#1 DISK DRIVE SYSTEM—J&M Controller, JDOS, ½ Ht. 40-track TEAC Drive, cable and manual (2nd Drive add $159)	**$379**
#2 FULL FEATURE PRINTER—Panasonic Model 1091, Near Letter Quality, Dot Matrix Graphics, with Metric Parallel Interface (PBH Interface add $20)	**$389**
#3 COMMUNICATIONS PACK—Volksmodem from Anchor, 300 baud, direct connect, cable and Colorcom-E terminal program (ROM or Disk)	**$115**
#4 MONITOR & DRIVER—New Taxan Hi-resolution Monitor, Green 12" display with Video Plus driver (easy to install) (Swivel base for monitor add $22)	**$159**

PLUS: Full Travel Keyboards	from **$64.95**
64K Expansion Kits (Prime IC's)	**$64.95**
Basic 1.2 or Disk 1.1 ROM's, each	**$39.95**

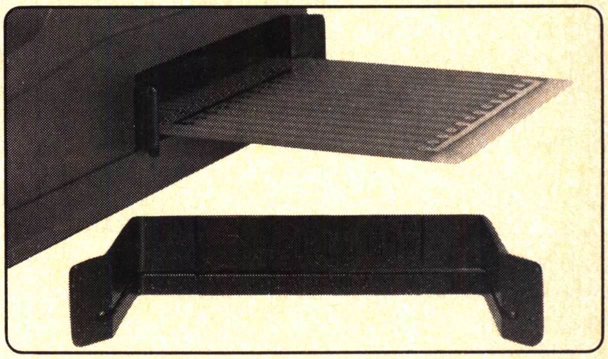
SOFTWARE, BOOKS—We carry over 200 titles from many fine companies. Give us a try!

POLYGON COMPUTERS
1316 Wilshire Blvd., Suite 206
Los Angeles, CA 90017
(213) 483-8388

Ca. Res. 6½% tax
Visit our Retail Store

Shipping: $2 Software
Charges: $5 Hardware

6809 SYSTEM DEVELOPMENT



EXPANSION HARDWARE FOR THE TRS-80 COLOR COMPUTER

XPNDR1™

CoCo Expander Card

Gold edge connector plugs into the CoCo cartridge connector. Signals are labeled on the bottom (wire side) with ground and power buses; plated through holes. The 4.3 × 6.2 inch glass/epoxy card is drilled for ICs and components. The finest bare breadboard for your CoCo. Includes 8 page ***Application Notes*** to help you get started.

$19.95 each or **2** for **$36**

SuperGuide™

Precision molded plastic insert designed specifically to align and support printed circuit cards in the CoCo cartridge slot; an unbreakable removable card guide. Patent Pending.

$3.95 each

Available now from:

ROBOTIC MICROSYSTEMS

BOX 30807 SEATTLE, WA 98103

A Fun, Monster-Filled Adventure

Middle Kingdom is a recent addition to the catalog of the good folks of Computerware in Encinitas, Calif. This is a high resolution Adventure game with the flavor of "Dungeons and Dragons." The object of the game is to recover three magic rings lost in the kingdom and return them to the sanctuary. Success is rewarded with the crown of the kingdom and failure is met with death. Obstacles to getting the rings are rather interesting creatures like orges, dwarfs, lizardmen, trolls, and goblins.

The graphics of *Middle Kingdom* are exceptional. The title screen displays the villians, weapons, and magical spells. There are three different skill levels and you are given a choice of being a magician, wizard, or merchant. You begin the Adventure in the sanctuary and can travel to the pyramid, catacombs, or temple to search for rings and treasure. The instructions tell you that the catacombs are more dangerous, but more rewarding. When you are in the sanctuary, an audible buzz is heard to alert you to where you are.

Movement is accomplished by using the arrow keys. In setting up the game at the beginning, you have a choice of slow, medium, or fast movement. Slow is suggested for beginners, but fast is much more interesting. Keyboard response is excellent!

Four weapons or spells are given to you at the beginning of the game. Other weapons and spells can be found in the graphics mazes. Weapons include such things as swords, daggers, axe, mace, long bow, and trident. Spells include lightning, petrifying light, fireballs, and stun spells. You are only allowed seven weapons or spells at a time, and when you find more than seven, you must choose one to drop. This is easy — the spells must be used quickly or they loose their power. Certain weapons work better on certain creatures, but you'll have to discover those on your own!

All action takes place on one screen. The top portion of the screen tells you your location, points accumulated, and time expired. The score and time have no relation to the success or failure of the game, but it is a nice feature. The second portion of the screen is where the action takes place. The maze structure takes you through the middle kingdom. The bottom portion of the screen lists your weapons which are controlled by number keys one through seven. Action summaries are given next on the screen. This information details the fighting that takes place and the treasures that you find. When you meet a creature, you automatically strike the first blow, and the result is recorded. Then the creature does its damage. The results of each conflict are tabulated at the bottom of the screen. You earn experience credits for each successful conflict, and your strength is updated after each action takes place. You begin this game with zero experience and strength from 150 to 250, depending on the skill level you chose at the beginning of the game. When your strength reaches zero, you die and the kingdom is lost.

Middle Kingdom is a well-developed software game. The game is well written, the graphics are tremendous, and the game operation is smooth as silk. I was able to conquer the middle kingdom on my second try (level one) and have won playing level three. The language is interesting and very creative. I especially liked the phrase, "You've been hit on the head . . . but no damage done!"

This is not a difficult game, and can be played by children as well as adults and I think this is very important for the consumer to know. A different kingdom is set up every time you play the game, so once you conquer the game, you can still enjoy playing it again and again. The game is winnable, and I welcome games for the Color Computer where the player can win. I have a concern about continually playing games where you always die and the only victory is how many points you get before you perish.

The only problem I see with *Middle Kingdom* is that it is a random-type game. You are given no hint or clue where creatures are hidden. Thus, there is no way you can avoid the monsters. Once you come in contact with them, you must fight, even if your strength value is almost gone. Because of this, the success or failure of the game is somewhat left up to chance. The effects of the weapons used in battle are also randomized.

I enjoyed *Middle Kingdom.* My nine-year-old son, Jeff, loves the game. I think he likes to win sometimes, but then, so !

(Computerware, 4403 Manchester Ave., Suite 102, Encinitas, CA 92024, 32K disk $27.95, tape $24.95)

— James Ray

One-Liner Contest Winner . . .

Did you ever wonder what a "bug" really looks like when it hits your prize-winning program? Well, just type this one-liner in and *RUN.*

The listing:

```
0 PMODE3,1:PCLS:DIMV(16,12):DIMB
(16,12):DRAW"M3,6E3NH3R6NH3F3G3N
G3L6NG3H3":GET(0,0)-(16,12),V,G:
PCLS:DRAW"M3,6E3NE3R6NE3F3G3NF3L
6NF3H3":GET(0,0)-(16,14),B,G:PCL
S:SCREEN1,0:FORX=1TO50:A=A+2:PUT
(A,1)-(A+16,14),V,PSET:A=A+2:PUT
(A,1)-(A+16,14),B,PSET:NEXT
```

Michael Cooney
Mansfield, OH

(This one-liner contest winner will receive this month's RAINBOW ON TAPE.)

Musica 2 — Creating Beautiful Music With Your CoCo

Ah, music, I'm one of those folks who enjoy listening to music, but have no talent playing a musical instrument. It's not that I haven't tried — I did my mandatory two years of piano lessons before my parents' patience and pocketbook gave up. I can still remember where middle C is, but not much more.

I was even in my high school marching band, attempting to play clarinet. I don't remember anything about the clarinet except that there was a rumor circulating around that playing a reed instrument made you a better kisser.

For you musical composers, let the forementioned serve as a warning. This is being reviewed by a novice. A novice who had fun.

My first exposure to the musical capabilities of my CoCo was when I learned about the *PLAY* and *SOUND* commands while fumbling through the instruction manuals included with the computer.

After playing *Three Blind Mice* and inserting some simple tunes into a few of the educational programs I wrote, my interest in the musical capabilities of the CoCo was at a low level.

My embers of curiosity, regarding the musical capabilities of my gray buddy, were rekindled when I obtained the *Music Library 100*. This program consisted of a bunch of songs generated using the *Musica 2 Music Synthesizer* program from Speech Systems.

The music generated by by *Music Library 100* was unlike anything I'd ever heard from my CoCo. Up to four voices are played at one time. And although the results sound like they're played through a Moog Synthesizer, the sounds were quite pleasant.

Music Library 100 only allows you to play songs which someone else had generated using *Musica* or *Musica 2*.

Would it be possible for my tin ear to compose palatable tunes? Anxious to find out, *Musica 2* was added to my stack of 5¼-inch disks.

Musica 2 also allows you to play music previously created using *Musica* or *Musica 2*. Eight songs are included to get you started; however, the real "meat" of the program is the ability to write your own compositions.

Entering music is quite easy as all notes are entered and displayed on standard musical treble and bass staffs. The position of each note is selected by moving a cursor up and down with the arrow keys or a joystick.

The music you are working on can be played at any time so you you can hear your masterpiece and if you wish, edit your creation. Insert, Delete and Block move commands are available just like a word processor.

Up to four voices (chords in four-part harmony) can be played at one time. Each voice can have its own timbre (such as the sound of a violin, flute, or oboe) and the assignment to each voice can be varied during the composition.

The tempo of the music can be varied during the composition and advanced users can play all sorts of aural tricks using a wave form synthesis option.

The tonal quality of your composition can be enhanced by using a remote speaker if your television can accomodate one. Most televisions called into service as CoCo monitors have poor speakers. For the ultimate sound reproduction, Speech Systems sells an attachment which plugs into the ROM port of the Color Computer and directs the output of *Musica 2* to an external stereo system. The Stereo Pak also separates the signals into treble and bass and creates an effect which is most impressive.

When your masterpiece is finished or you'd like to stop, the composition can be saved to disk or tape using standard format files. You can also assess and play your composition from a BASIC program.

For posterity, or if you want to submit your composition to Carly Simon and make your next fortune, you can print out your score using a dot matrix printer. The program will print out the notes on the standard musical bass and treble staffs. While this is a very nice option, if you have a long composition, be prepared for a long wait, because the printout is slow.

How does *Musica 2* make all those great sounds? Here is Speech Systems' explanation:

Musica 2 generates a stream of numbers that the Color Computer converts to voltages through the sound port (6-bit digital-to-analog converter). By varying the numbers and thus the voltages at the appropriate rate, a tone is produced through the TV speaker. Pitch is varied by skipping a certain numbers of values. This method of varying pitch makes it possible to produce more than one note at once.

How good is the music you can produce using *Musica 2*? How good is a Steinway? The answer varies with how much talent you have and how much time you are willing to invest. The tools for creating your masterpiece are there — you just need to apply the time, energy and talent.

If you have a 32K minimum Extended BASIC CoCo and an urge to create beautiful music or even MTV rock, *Musica 2* may be for you.

(Speech Systems, 38W255 Deerpath Road, Batavia, IL 60510, tape $34.95, disk $39.95, Stereo Pak $39.95)

— Bruce Rothermel

OS-9 USERS
ELIMINATE DISK HANDLING
Patch for OS-9 single disk operation for CoCo's with ROM 1.0
Easy, Quick Patch

Send $9.95 to:

Multi Venture

Multi-Venture
P.O. Box 6157
Alderwood Manor, Wa.
98036

Postage & Handling included. *No Refunds*

Happy Birthday, Mr. Gift Is A Gift For Young Children

When children first learn to read, vowel discrimination and pronunciation are some of the more difficult tasks they need to accomplish. When should they use a short sound and when is a long sound appropriate? It is very easy to mix up words like pin and pen. There are rules to be learned. *Happy Birthday, Mr. Gift* is an attempt by Teksym Corporation to reinforce the vowel rules for reading.

After the program is *CLOADMed*, the child is asked to type his/her name. At this time a personalized invitation to Mr. Gift's birthday party appears on the screen and a voice reads it to the child. The audio capabilities of the CoCo are put to full use with this program. The child can hear all descriptions and instructions. There are five levels from which to choose, ranging from Level 1, which allows the child to answer with no time limit, to Level 5, which gives the user five seconds to answer.

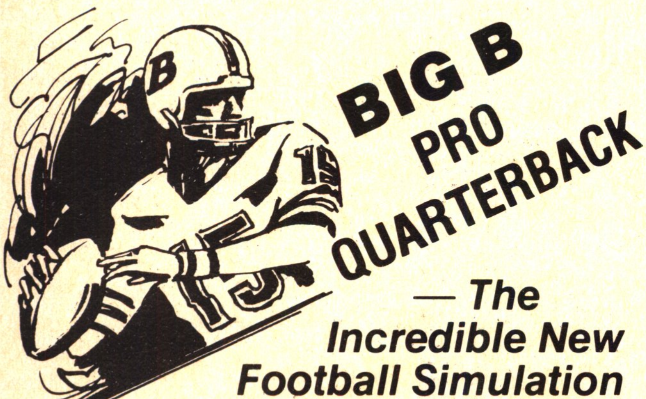
During the game portion of the program, a picture appears with two words next to it. For example, the child is told that Uncle Bill is giving Mr. Gift a present (the picture). The child is asked to identify the gift by choosing 1) tee or 2) tie. The user can enter his choice in one of two ways. He can simply press the number key or select the appropriate arrow that points to the number of his answer. After 10 words and pictures the game is over. If the child has not identified all of the objects correctly, the screen will simply flash. If he has gotten all 10 answers correct, a birthday cake will be drawn and music will play. By turning the tape over and starting at the beginning of the tape, the game can be played again without having to reload the "control" program.

As I sat down and played this game, I couldn't believe how bored I was. The game seemed to move *so* slowly and the taped voice became more and more annoying to me. Realizing that this program was meant for beginning readers (K-2), I went in search of a first grader and Kenny, age six, came to my rescue. He spent quite a bit of time with *Mr. Gift* and he made quite a few mistakes the first time he used the program. The most confusing part for him was in the use of the arrows to answer. This is explained in the documentation as a way for children who don't know numbers to answer the questions. Once he was able to straighten this part out, he went on to enjoy the game. As with most young children, he really liked being able to use the computer.

After watching and listening to Kenny, I really had to reassess my opinion. I now find that it is perfectly suited to the age group for which it was written. Kenny was able to use the program without adult supervision or assistance. He used the program repeatedly and said that it wasn't too hard or too easy for him. It was obvious that he enjoyed playing. Its biggest flaw is that it only offers 10 problems. Keeping in mind the intended user, *Happy Birthday, Mr. Gift* is a useful supplement for a child who is learning to read.

(Teksym Corporation, 14504 County Road 15, Minneapolis, MN 55441, tape $14.95)

— Stephanie Snyder



BIG B PRO QUARTERBACK

— The Incredible New Football Simulation for the Color Computer!

- Pass, Run, or Kick — You call the Plays!
- Compete with friends or challenge the computer.
- Contains extended basic and non-extended basic versions for 16K cassette color computers.

Send $16.95 (check or money order) for each game (Colorado residents add 3½% sales tax). Allow four weeks for delivery.

Big B Software
P. O. Box 91
Broomfield, Colorado 80020

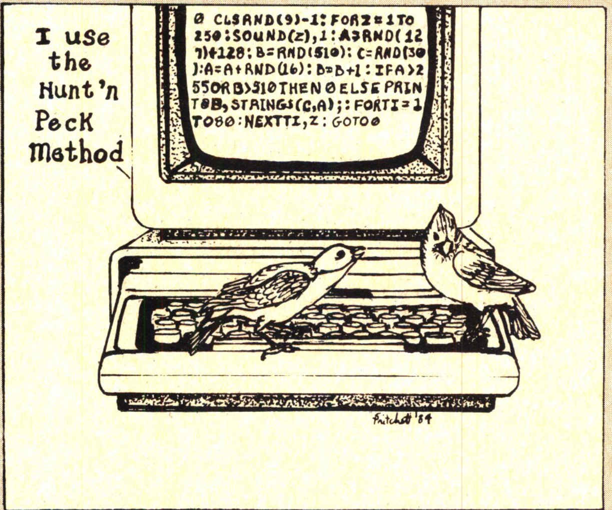
Please send me ______ game(s) @ $16.95 each.

Name ______

Address ______

City, State, Zip ______

One-Liner Contest Winner . . .


I use the Hunt'n Peck Method
0 CLSRND(9)-1:FORZ=1TO
250:SOUND(Z),1:A=RND(12
7)+128:B=RND(510):C=RND(30
):A=A+RND(16):B=B+1:IFA>2
55ORB>510THEN0ELSEPRIN
T@B,STRING$(C,A);:FORTI=1
TO80:NEXTTI,Z:GOTO0
Pritchett '84

```
0 CLSRND(9)-1:FORZ=1TO250:SOUND(
Z),1:A=RND(127)+128:B=RND(510):C
=RND(30):A=A+RND(16):B=B+1:IFA>2
55ORB>510THEN0ELSEPRINT@B,STRING
$(C,A):FORTI=1TO80:NEXTTI,Z:GOTO
0
```

Steve D. Pritchett
Jacksonville, AL

(For this winning one-liner contest entry, the author has been sent copies of both *The Rainbow Book Of Adventures* and its companion *Rainbow Adventure Tape.)*

Develop Your Own Adventure With *Adventure Generator*

By Jorge Mir

I have always enjoyed computer Adventures. As a child I had a vivid imagination and I seem to have retained a good portion of it because I can really get engulfed while solving Adventures on my CoCo.

You might recall the July and August 1982 issues of THE RAINBOW where my articles on Adventure writing were published. The August issue contained an Adventure driver program to aid in developing them, however, it required some programming knowledge to develop your own Adventures since it only provided the logical steps needed to process the Adventurer's commands.

Well, CoCo owners now have an Adventure generator program which will allow the development of Adventures without any programming knowledge.

The Spectrum Projects' *Adventure Generator* (called *SAG*) allows you to develop your own Adventures and compiles them in machine language so that they can be played at a much higher speed as compared to BASIC Adventures. Not only that, but after you have created your Adventure and are ready to save it, *SAG* gives you the choice of creating a regular silent Adventure or one that talks! Yes, that's correct. Adventures created with *SAG* can be played with the Spectrum Projects' Voice Pak!

Having the ability to create talking Adventures should prove to be quite interesting since it opens up a new avenue to explore for all of us engaged in Adventure writing.

SAG requires a disk system with at least 32K of memory (64K for talking Adventures) and it comes with a series of programs to allow maximum usage of the CoCo's memory while developing your Adventure. These programs are linked to each other through the use of menus, making it simple for the user to follow the various steps necessary as the Adventure is being generated.

The system's programs are a series of editors allowing you to enter the various verbs, rooms, objects, flags and messages necessary to process the commands entered by the Adventurer as the game is being solved.

As with any CoCo program, there are some limitations. *SAG* contains the following limits for each item:

	Maximum Number	Maximum Bytes
Verbs	70	400
Objects	255	3,100
Rooms	99	2,800
Messages	510	8,600
Program lines	700	8,600

The maximum number of bytes for program lines in a talking Adventure is 7,680. Also, both versions can have up to 255 flags to test conditions throughout the game. This gives us a lot of space for developing some pretty interesting Adventures.

As each section of the Adventure is being developed, you are shown the number of items entered and the number of bytes available in each section. This is quite helpful in judging how much room there is left for additional data.

The various editors allow you to enter each item giving you the ability to further edit or delete them at any stage of development. Each editor allows you to save data independently of other editors. This is an excellent feature since it allows you to start with a very short Adventure and continue to expand it as you go along.

As you enter each object, you are prompted for additional information: message number if the object is examined, whether the item can be readily seen or not, whether it can be "gotten" or not and the room number where the object starts in the game. As you enter the room data, you are also prompted for the obvious exits out of the room (north, south, east, west, up or down).

The Flag editor is simple and straightforward, but you should take some care in designing your flags if you are a beginner in Adventure writing. The simplest way to explain what a flag does is that it helps you to test conditions using a minimum of computer memory. Flags can be set to equal either a numeric one or a numeric zero. A one indicates the flag is set and a zero indicates it is not set. When designing flags, I always describe the flag so that if it is set to one it it means "yes" and if it is reset to zero it means "no." For example, if a flag description is "Door is unlocked" and the flag has a value of one then it means, "yes, door is unlocked" otherwise it would mean it is not unlocked.

When reading about the limitations of the program, you may have wondered if 700 lines for the Adventure program would be sufficient for some of the more complex Adven-

FLY at MACH 2!

F-16 Instrument Flight Simulator
DON'T CHUG AROUND AT 90 KNOTS WITH OTHER SIMULATORS. F-16 FLYS MACH 2.6, IS FULLY AEROBATIC, VERY REALISTIC....................$21.95

DESCENDERS
100% ML FOR RADIO SHACK® LPVII, DMP100, TDP-1, AND GORILLA BANANA® $17.95

TSPOOL
100% ML SOFTWARE SPOOLER FOR TELEWRITER-64® ONLY. INCLUDES DESCENDERS. $24.95

TELEWRITER-64
THE BEST CoCo WORD PROCESSOR AVAILABLE TODAY!
TAPE....................$49.94 DISK....................$59.95

ELITE•CALC
THE BEST CoCo SPREADSHEET $59.95

ELITE•FILE
THE BEST CoCo DATABASE MANAGER $74.50

CALL (813) 321-2840 9-5 PM EST FOR ORDERING OR INFORMATION

KRT Software Inc.
P. O. Box 41395
St. Petersburg, Florida 33743

tures. Well, I wouldn't worry too much about it. The system's program line editor follows a unique language especially designed to conserve memory and, yet, allow you maximum flexibility when designing your Adventure.

When you first read the manual that comes along with the system, it seems a little hard to grasp how this language works. But, when you get to the line editor program, the screen is full of information so that you don't have to refer back to the manual when developing your program. This is a big plus.

Each program line entered by the Adventure writer is to test a condition. If that condition is matched, then the outcome, as entered by the writer, will take place. Let's assume your Adventure has a door that can only be opened if the player has a key in inventory. Logically, your Adventure might look like this:

IF verb is number 10 (unlock), and object is number 5 (door) and you are in room number 2 (in front of a house) and object number 8 (key) is in inventory, *THEN* set flag number 6 (door is unlocked) and print message number 20 (the door is now unlocked).

To accomplish the above, you will enter the following program line with the language editor: *V10N5R2I8*=S6P20.

To the left of the equal sign is the condition which, when matched, will result in the outcome shown to the right of the equal sign. I am sure you can now appreciate how much you can really accomplish in a single program line, so you can imagine what you can do with 700 of them!

Once you have entered all your verbs, objects, rooms, flags, messages and have completed your program lines, there are two compilations to be made. First, you have to compile the language lines (one of the selections from the main menu in the language editor program). Next, you have to compile the entire Adventure (a choice from the main menu) at which time you have your choice as to whether you want the Adventure to be silent or a talking one. You will also have to decide other things, such as maximum number of items the player is allowed to carry in inventory, the room number where you want the Adventure to start, etc. You will always be prompted for information required by the system, so there is no need to refer back to the manual. That's what I call a "user friendly" system (some people may call it "idiot proof," with all due respect to the user).

Not only do you have a choice as to whether your Adventure should be silent or talkative, but you can recompile a silent Adventure into a talkative one or vice versa without the need to re-enter any of the data. That's another big plus.

When developing a talking Adventure, you need to be in the all RAM mode, using 64K and, of course, be familiar with the use of the Spectrum Projects' Voice Pak. A short subroutine is included with the system so you can switch the computer to the all RAM mode.

A programmer usually tries to place him/herself in the user's place when designing systems so that such systems will meet as many requirements imposed by the user as possible. Since it is impossible to satisfy everyone, users can usually readily point out, from their perspective, those features which are missing in the system. Following are the faults I found when using the system.

The condition/result combination (if such conditions are met, then do the following), could have been expanded to allow an *ELSE* result. Using the above illustration when trying to unlock a door, it would have been nice if the user could expand the step so that if the condition is not met (for example, if the key was not in inventory), then another set of program lines would execute, such as printing a message like "you need a key to unlock the door." You can work around this apparent deficiency by adding a next step to test if the door is still locked (without testing to see if the key is in inventory) and then printing the above message if it is not in inventory. Nevertheless, it would have been nice to have the *"IF-THEN-ELSE"* capability.

Another inconvenience is the fact that all objects or nouns must contain at least four letters. This is a problem if you use words such as DOG, CAT, LOG, KEY, ICE, TIE, POT, CUP, etc. After you describe the object, you have to enter a four-letter abbreviation and that is where the inconvenience pops up. You can get around it by changing your objects such as calling a KEY a BRASSKEY so the abbreviation can be BRAS, or calling the ICE an ICECUBE, with the ICEC abbreviation for it. Nevertheless, it would be much nicer if less than four letters could be used as abbreviations for each object. I have communicated this deficiency to Spectrum Projects to see if it can be corrected and they have promised to look into it.

Please keep in mind that this program is not designed to teach you how to write Adventures. It is simply a great program to allow you to develop Adventures once you have formulated them in your mind or on paper. If you try to develop an Adventure and think it out as you enter all of the data using the *SAG* system, you are bound to become very discouraged since things will not take place as you envision them. You must first design the Adventure, preferably on paper, indicating all of the facts to be encountered by the adventurer and all of the conditions to be tested along with the related outcomes. After all that is done, then run the *SAG* system to get all the programming accomplished.

Since most people just like to jump into things, I am sure many who will buy this system will not follow the above advice. Well, *SAG* takes care of this problem nicely, since you can always go back and edit any of the data previously entered and recompile the Adventure again. It would just be a lot easier and less time consuming to complete the Adventure if it is well thought out before you start using the *SAG* system.

Overall, I think this is a great system for those interested in writing Adventures. It sure eliminates a lot of time involved in developing them and allows the non-programmer to develop some very interesting Adventures since no programming knowledge is required.

Try *SAG*, you'll like it!

(Spectrum Projects, P.O. Box 9866, San Jose, CA 95157-0866 or P.O. Box 21272, Woodhaven, NY 11421, $39.95 plus $3 S/H)

16K ADVENTURE GENERATOR .... TAPE $19.95
Create your own adventure with this program. Should be familiar with proper basic syntax to use. Writes adventure game directly to tape.

16K ADVENTURE STARTER PACKAGE ... TAPE $14.95
Three graduated adventure games designed to guide you from beginner to tackling the expert level adventure games with confidence.

SOFTECH
P.O. BOX 3330
Cheyenne, WY 82003

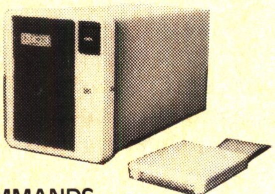
HARD DISK *for the CO CO*

5 meg ~~$1295~~ *10 meg ~~$1595~~*

---------- COMPLETE SYSTEM ---------- JUST PLUG IN ----------

HARD DISK - OPERATING SYSTEM features

- FULLY INTEGRATED INTO COLOR DISK BASIC
- TAPE TO HARD DISK
- DISK TO HARD DISK
- HARD DISK TO TAPE
- HARD DISK TO DISK
- DUPLICATE
- COLD START
- M-RUN
- ALL EXTENDED DISK BASIC COMMANDS



without hard drive ...
INTERFACE CARD & H-DOS

operating system only
~~$425.00~~

PERIPHERAL *H-DOS UTILITY PACK* $129.00
BOOT STRAPS OS-9 OR FLEX, MDIR (master directory)

128 K - RAM CARD

INCREASE YOUR 64 K Co-Co OR Co-Co II TO 128 K RAM

☐ FITS COMPLETELY INSIDE YOUR COMPUTER.

☐ SWITCHES TWO NEW 32 K BANKS OF RAM IN AND OUT OF MEMORY.

☐ BANKS CAN BE MAPPED IN THE UPPER HALF OR LOWER HALF, OR CAN ALSO BE A SECOND COMPLETE 64 K BANK.

☐ SWITCH TABLES INCLUDED.

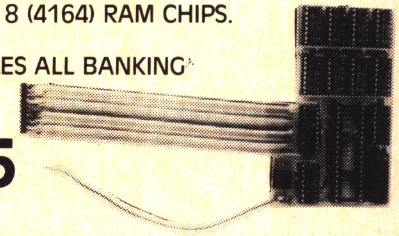
☐ SIMPLE INSTALLATION AND DOCUMENTATION.

☐ A MUST FOR OS-9 USERS.

☐ COMPLETE WITH 8 (4164) RAM CHIPS.

☐ PAL CHIP HANDLES ALL BANKING COMMANDS.

$149.95



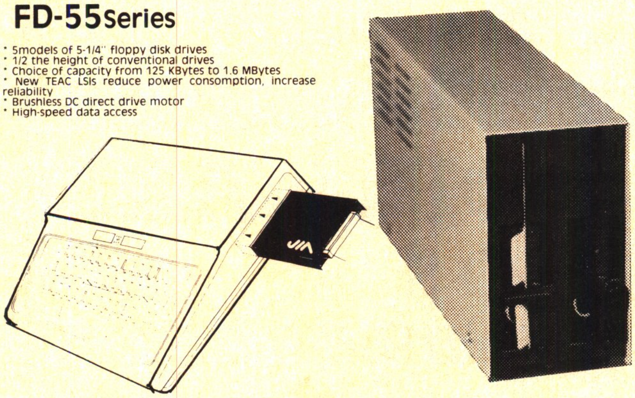
DISK DRIVES *for the* CoCo

TANDON DISK DRIVES
40 track - 6 ms trk-trk
FULLY COMPATIBLE

TEAC *DISK DRIVES*

FD-55Series

- 5models of 5-1/4'' floppy disk drives
- 1/2 the height of conventional drives
- Choice of capacity from 125 KBytes to 1.6 MBytes
- New TEAC LSIs reduce power consomption, increase reliability
- Brushless DC direct drive motor
- High-speed data access

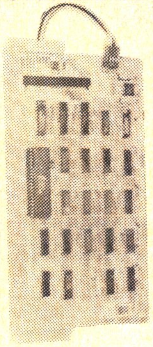


Super Sale on New Disk Drives

Distributor for - SOFTWARE SUPPORT, INC. Framingham, MA.

MODEL III & 4 DISK CONTROLLER KIT

☐ AVAILABLE FOR FULL HIGHT OR SLIM LINE DRIVES
☐ EASY INSTALLATION
☐ FULLY TESTED AND ASSEMBLED
☐ COMPLETE WITH EASY INSTRUCTIONS
☐ J & M SYSTEMS CONTROLLER



USA
RGS MICRO INC.
MAIN STREET
DERBY LINE, VERMONT
ZIP 05830
TEL: 802-873-3386
ORDER LINE 800-361-4970

RGS MICRO INC.

CANADA
RGS MICRO INC.
759, VICTORIA SQUARE 405
MONTREAL H2Y 2J3
TEL.:(514) 287-1563
ORDER LINE ONLY ★ ★ ★
QUÉBEC - ONTARIO - MARITIMES
800-361-5338
WESTERN CANADA 800-361-5155

TERMS: VISA - MASTER CARD - AMERICAN EXPRESS —— **HOURS:** MONDAY - SATURDAY 10:00 AM - 6:00 PM

Colorgrade — An Educational Application Program

By T. Gray

Choosing a gradebook is largely a matter of personal taste. A system that suits your school or district might be unacceptable in the next county or state. With this in mind, I'll try to describe *Colorgrade* accurately enough for you to judge its usefulness in your classroom while at the same time indicating my personal reaction to it.

Colorgrade will allow you to keep test scores for up to 40 students in each of six classes. The number of test scores seems to be limited only by the free disk space, which starts out at 40 grans. If you have more than six classes, you will have to put the others on a backup disk. While some teachers might prefer to have all records on a single disk, others may even prefer to have a disk for each class (remember the danger of having all your eggs in one basket!).

The program is menu-driven and, with a couple of exceptions, user-friendly, to the point where the simple three-page documentation is almost unnecessary. In most cases, destructive procedures are decision-checked, and in most cases hitting ENTER will allow you to escape from a routine. The "in most cases" should tip you off to some problems.

The first menu, with set-up routines, uses an odd backward approach — you do number four before number three and so on. The only reason I can think of for this is to put the least destructive option at the top. At any rate, option four kills all files on the disk to clear space for a new year or semester. You might not want to do this; our school retains grades until the next school year as evidence in case of appeals, lost report cards, etc.

Option three sets up class names (subject, period number, or a combination of words and numbers such as SCI 7A or Computing Science 10). Use *short*, simple names, because you'll be typing them often and *Colorgrade* doesn't like variations in spelling (for example "7" instead of "SCI 7" crashed the program).

The second choice sets up a grading scale, allowing you to set the value of an A+ or an A–. You'd normally do this only once at the start of term and then leave it alone. The documentation does not say if there are default values for this, and there is no option (that I could find) allowing you to see just what you entered way back in September.

Choice one is for entering student names into each class file you designated in three. It would be nice to be able to enter a list of names and then set up class periods. I teach the same students science and math, for example, and this program makes me type in 41 student names *twice*. Just think what fun you'll have if you have those students for six or eight subjects! (And you thought the computer would *save* you work!) The names are automatically alphabetized by what I assume (from the time required to sort my already-alphabetized class lists) is a basic sort.

Now your gradebook is set up. A second menu appears, giving you the option of normal operations, print options, or starting new. Since the print options give you nicely formatted hard copies of the normal operations, I will not discuss them in detail. They worked well on a LPVII, looked

WORKBASE

BUSINESS SOFTWARE

$ PORTFOLIO $

BUSINESS DATABASE SYSTEMS

An economical and powerful business management database system. A few of the many features of WORKBASE I & II are: • a spread sheet module to define and store calculations for updating your database • a report module to define and store unlimited report formats with totals and headings • a word processor to merge a database with custom letters, reports, and mailing labels • utilities for generating, merging, summarizing, and updating • only 1 disk drive and a 32K Color Computer are required • 216 page step-by-step user's manual with tutorial and separate demonstration disk.

WORKBASE DATABASE I — 600 Records $64.95
WORKBASE DATABASE II — 1200 Records $79.95

BUSINESS APPLICATION PACKAGES

Self-contained application programs which can be used independently, in combinations or with WORKBASE DATABASE I or II for additional updating and reporting. The following apply to each application package: • predefined reports • print or display selected records • simultaneous updating of related database files • 600 records per predefined database • built in calculations • menu driven • complete audit trails • 40 to 50 page step-by-step user's manual.

Packages currently available: • INVENTORY CONTROL • ACCOUNTS RECEIVABLE • SALES ORDER ENTRY • CHURCH MEMBERSHIP • ACCOUNTS PAYABLE • PURCHASE ORDERS • RENTAL PROPERTY MANAGEMENT • GENERAL LEDGER • PAYROLL
COST PER PACKAGE $24.95 ($19.95 when purchasing 2 or more)

BUY WORKBASE DATABASE I or II AND GET ONE APPLICATION PACKAGE FOR $19.95

• SEND CHECK OR MONEY ORDER OR USE OUR TOLL FREE NUMBER FOR PLACING CREDIT CARD ORDERS: 1-800-334-0854 (Ext. 887)

• PRICE INCLUDES SHIPPING & HANDLING WITHIN USA • ADD $5 FOR ALL FOREIGN ORDERS • CASH ONLY COD ORDERS ADD $2 • NC RESIDENTS ADD 4.5% SALES TAX

WORKBASE DATA SYSTEMS
P.O. Box 3448, Durham, N.C. 27702•(919)286-3445

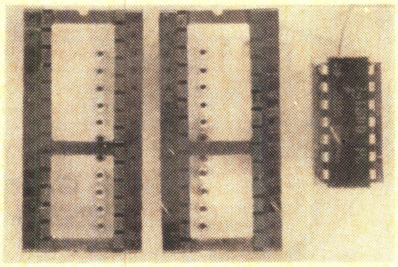
16 K DOS CARD

☐ PLUGS INTO YOUR J-M DISK CONTROLLER AND ALLOWS YOU TO MAP ON AN EXTRA 8 K E-PROM ABOVE DOS.

☐ USE YOUR OWN 24 PIN, 8 K DOS AND ONE 2764 E-PROM OR TWO 2764 E-PROMS.

☐ GREAT FOR UTILITIES OR A MACHINE LANGUAGE MONITOR.

☐ ON BOARD DE-CODING, ONLY ONE WIRE TO SOLDER. COMPLETE WITH INSTRUCTIONS.



$19.95

RGS DUAL DOS CARD

WITH SWITCH SELECTOR

DESIGNED TO ACCOMODATE TWO DIFFERENT DOS CHIPS INSIDE YOUR J-M DISK CONTROLLER.

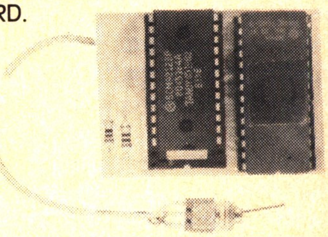
☐ PIN TO PIN COMPATIBLE WITH RS-DOS AND J-DOS CHIPS.

☐ THE SWITCH ALLOWS YOU TO HARD SELECT ANY ONE OF THE TWO DOS SYSTEMS OF YOUR CHOICE.

☐ IN CENTER POSITION, THE SWITCH DISCONNECTS FROM THE DOS AND BRINGS YOU BACK TO BASIC.

☐ DESIGNED FOR ONE 24 PIN ROM AND A 28 PIN E-PROM OR TWO 28 PIN E-PROM CONFIGURATION.

☐ EASILY MODIFIED BY CUTTING TWO TRACES ON THE BACK OF THE BOARD.

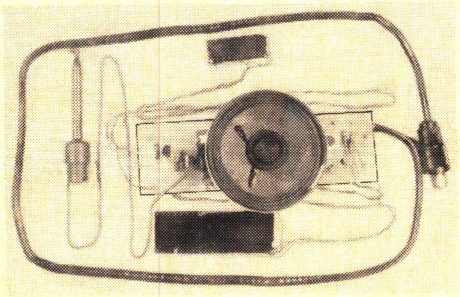


$19.95
(Board with switch only)

VIDEO PAL

☐ AUDIO-VIDEO INTERFACE
☐ MONOCHROME COMPOSITE OUTPUT
☐ EASY TO INSTALL, FITS UNDER YOUR KEYBOARD
☐ NO SOLDERING!
☐ BUILT-IN SPEAKER
☐ DOES NOT DISABLE YOUR REGULAR T.V. OUTPUT
☐ FULLY TESTED AND ASSEMBLED
☐ COMPLETE WITH INSTRUCTIONS.

ALSO AVAILABLE FOR COLOR MONITORS



$29.95

PROJECT BOARD

A MUST FOR EXPERIMENTS

☐ UNLIMITED CHIP POSITIONS

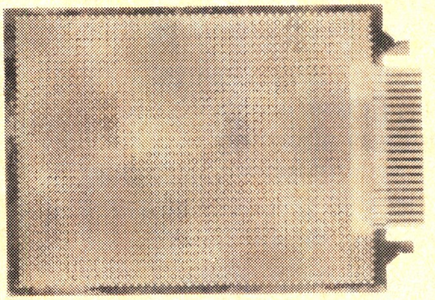
☐ GOLD PLATED EDGE-CARD CONNECTOR

☐ FITS INTO ANY RS DISK PACK

☐ HOLES PLATED THROUGH BOTH SIDES

☐ EASY TO WIRE - WRAP

GREAT TO BUILD YOUR "TURN OF THE SCREW" PROJECTS.



$19.95
(TWO FOR $34.95)

USA
RGS MICRO INC.
MAIN STREET
DERBY LINE, VERMONT
ZIP 05830
TEL: 802-873-3386
ORDER LINE 800-361-4970

RGS MICRO INC.

CANADA
RGS MICRO INC.
759, VICTORIA SQUARE 405
MONTRÉAL H2Y 2J3
TEL.:(514) 287-1563
ORDER LINE ONLY ★ ★ ★
QUÉBEC - ONTARIO - MARITIMES
800-361-5338
WESTERN CANADA 800-361-5155

TERMS: VISA - MASTER CARD - AMERICAN EXPRESS —— **HOURS:** MONDAY - SATURDAY 10:00 AM - 6:00 PM good, and would be perfectly suitable for use as interim report cards or as a printed backup of your grades (a good idea, by the way).

"Normal Operations" includes nine options, six for daily record keeping and three for end-of-term reporting.

1) See Grades for Entire Class — This gives you a look at the current average (raw score/total, percent, letter grade) of each student in a class, in pages of about 13 students, followed automatically by a grade breakdown showing the number of A's, B's, etc., and the percentage of the class scoring at that grade level. This option does not give you the class average nor does it give you scores on past tests — only the current average. The grade breakdown gives you an idea of modality, but *Colorgrade* does not report mean, median, or other statistics.

2) See Grades for One Student — Here, you are given a list of test names with accompanying raw score and percent for each test. You also get the student's total accumulated percent and letter grade. I felt this was one of the best features of *Colorgrade*. It gives a review of student progress; a printout of this provides a quick report card. I have used this with my present gradebook program (Tom Mix's *Teacher Database*) and it has really motivated students to make up missed or late work, or to improve their averages.

3) Record Grades — You'll be using this one frequently to enter the name of a test or activity, the total score possible, and the score for each student. The names appear in alphabetic order on screen, so you might want to sort test papers before you start entering scores (the random entry in Tom Mix's version avoids this). *Colorgrade* will automatically calculate the percent and letter grade for each student. One minor annoyance I found was that the disk was accessed after each two students, slowing data entry. I had to keep waiting and watching the screen for the next name to come up. A sound cue, such as those used for incorrect key entries, would let me know that I could enter the next score. However, if you don't touch-type, you will not find this delay a problem.

One major flaw in the entry segment is that there is no check on the score entered. It is possible to enter a score larger than the total number of points on the test — and a score of 290 out of 60 is a guaranteed "A"! A computer check would save you some work in proofreading for such blatant typos.

4) Change a Grade — If you do have an error in a score, or if you need to add scores from late assignments or work completed after an absence, this lets you fix things up.

5) Delete a Student — This gave me a cheap thrill: every teacher has a couple of students he'd like to delete. However, this option only removes a student name from the list. It apparently clears out all the student's records. Be sure you get the name right the first time, because there is no decision-check ("Is this the student you want deleted?") and once you've pressed ENTER little Billy is gone.

6) Add a Student — As you'd expect, with the added bonus that the name is automatically placed in alphabetic order. The new student is given an "incomplete" on tests currently in file. It is a nice feature.

7) Save Grades - Grading Period — At the end of a term, or whenever you run out of disk space, you can choose this option. It saves the current average (letter grade only, as far as I could see) for each student in a specified class. The lack of a percent score made this option almost useless to me, as our reporting is done in percents.

Talk is Cheap!
your Color Computer can talk for only
$29.95

SPEAK UP!™ is a machine language, voice synthesizer program for the TRS-80 Color Computer.* It is 100% software—nothing else to buy. Best of all, *YOU* can make BASIC programs talk!

- 16K, 32K, 64K all on one cassette
- Text-to-speech makes it easy to use
- SPEAK UP! will say anything
- Reviewed in April '83 issue of *Rainbow*
- Reviewed in Oct. '83 *Color Computer*
- COD, VISA, MC, checks—no delay

ORDER NOW 800-334-0854 EXT.890

MasterCard RAINBOW CERTIFICATION SEAL VISA

Classical Computing, Inc.
P.O. Box 3318
Chapel Hill, NC 27515

*TM by Tandy Corp.

FOR GIRLS ONLY!

▶ An easy-to-use program in **high resolution color** that will attract little girls to computers.

THE DESIGNER: Create original clothes for a high-fashion model, using more than 1,000 style combinations in thousands of color and fabric options, or design your own original fabrics from textures, stripes and plaids in color combinations almost never seen on the Color Computer. The memory "closet" will hold up to 30 different outfits at once, so girls can save their favorites and show them off. Simple to use and an excellent manual is included.
Program requires 32K Extended Color Basic

Disk: $24.95

Name: ______________________
Address: ______________________
City: ____________ State: _____ Zip: ________

COGNITIVE DEVELOPMENT CO.
fun things for the mind

Enclosed is my check for $24.95 ☐
Charge my ☐ Visa or ☐ Mastercard
Card # ______________ Exp. date: ______
Signature: ______________________

Suite 141A 12345 Lake City Way, NE
Seattle, WA 98125

The procedure also kills all your previous records on that class. This total obliteration is mentioned briefly in the documentation, but it is not even hinted at on the screen. I can only hope that Computer Island will put cautions and decision checks into the destructive options five and seven.

8) List Letter Grades — You can scan the letter grades of previous terms as well as the current accumulated average (final) grade. A printout can also be obtained. The ads for *Colorgrade* say that the program gives a "weighted average," but the documentation does not explain how to weight scores. Since our school uses a formula for weighting term scores to produce the course mark, *Colorgrade* wouldn't help me in June.

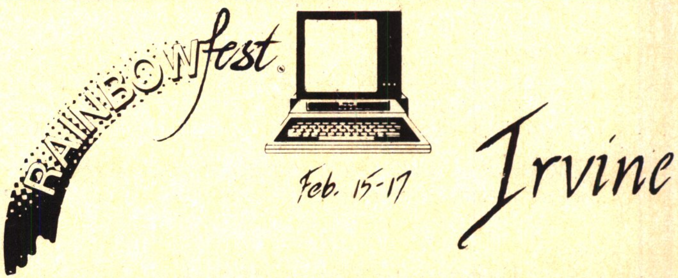
9) Change a Letter Grade — If for any reason a student's final grade is incorrect, it can be changed.

What would I like to see changed on *Colorgrade*? Some format errors break words up on the screen. Occasionally, some screens flashed past too quickly to read; one such was the "student not found" message in the Change a Score procedure. Already mentioned is the need for decision checks on destructive procedures and the desirability of checking entered scores against the stated total. It would have been useful to have some statistics (at least the class average) computed on each test, and reported. The slowness of data entry annoyed me, but here I am being picky. My main problem with the program was its failure to carry the current percent average over to the final grade and its (seeming) inability to perform its advertised weighting of scores.

There are some things I liked. The grade-scale option allows you to change the grading scale to suit your school standards or your needs. The documentation doesn't mention it, but this also allows you to correct for skewed data and normalize your grades. This is occasionally necessary to overcome the effects of an examination that is too difficult or too easy. I liked the automatic current average, given in the three forms (ratio, percent, and letter grade). The documentation is adequate, if brief, and assumes you are not going to want to customize the program. However, the whole thing is in BASIC so you can change it if you wish. Backing up the unprotected disk is a snap. (The documentation advises you to make one backup and I'd need several to make full use of the program.) The program is pretty easy to use once you get the hang of it.

Colorgrade lacks featuers I am used to in the gradebook I use on the Apple at school and in my present CoCo gradebook. However, this Computer Island product costs half as much as my CoCo version and about a quarter as much as the Apple version. Given this price differential, and the fact that *Colorgrade* does its job well enough, it's a good buy if it will suit your needs. It's a matter of taste.

(Computer Island, Dept. R, 227 Hampton Green, Staten Island, NY 10312, 32K ECB, tape $29.95)



Holiday Special

Basic Technology Offers the Most Features and Best Quality at New Holiday Prices.

RAINBOW CERTIFICATION SEAL

NEW PRICE on Parallel Printer Interface! Direct connection to your parallel printer. Full handshaking for maximum data transfer. Centronics compatible connector and cable included.
~~$79.95~~ **$64.95**

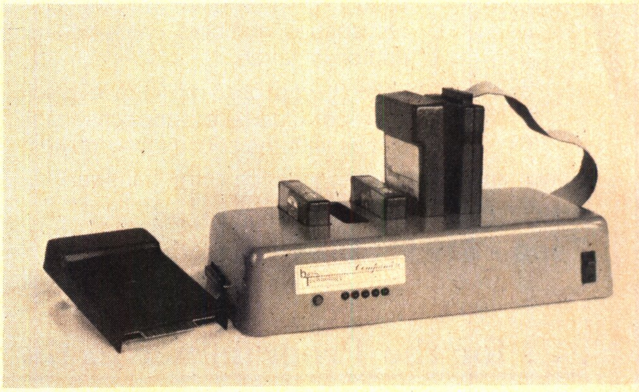
NEW PRICE on Real Time Clock/Calendar! Full feature clock/calendar with built in rechargeable battery and charger (requires 12 volts in computer or expansion). Day, date, 12/24 Hour, BCD/Binary, automatic leap year and daylight savings time and more. The best at a new low price.
~~$109.00~~ **$94.95**

NEW PRICE on Versatile Interface Port! Two 8-bit ports with four control lines — a total of 20 I/O lines for controlling a robot, reading instruments, controls of all kinds.
~~$69.95~~ **$59.95**

The Companion — A five slot multipack with position indicator lights and ON/OFF lamp, cold start reset, slots software or pushbutton selectable, built-in 5 volt supply and gold connectors.
~~$225.00~~ **$179.95**

basic TECHNOLOGY Dept. Q P.O. Box 511 Ortonville, MI 48462
(313) 627-6146

PARALLEL PORTS REAL TIME CLOCKS EXPANSION



The BT-1000 Expansion Interface Unit is a five slot expansion for dedicated systems. Plug in a disk drive and I/O peripherals. Built-in +/- 12 volt and 5 volt supplies. Gold connectors, lighted ON/OFF switch, sockets for 8K of RAM/EPROM.
~~$250.00~~ **$199.95**
With 8K installed RAM ~~$275.00~~ **$224.95**

A machine language driver for Color Basic is included with each peripheral (except BT-1030). OS9 drivers with source and installation instructions are available at $15.00 each for parallel and serial ports and clocks.

VISA **ORDER NOW** MasterCard
FOR HOLIDAY DELIVERY!

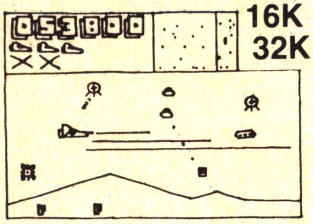
Add $5 shipping and handling. COD charge $2. Michigan residents add 4% sales tax.

Sugar Software

Sugar and Spice and Everything Nice . . .
We have the gift for everyone on your list!

. . . for the Arcade Game Player

Flying Tigers

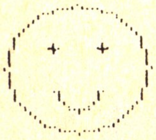


16K Tape - $24.95
32K Disk - $27.95

- Try your skill and strategy against 7 different kinds of aliens
- 5 levels of difficulty
- Super hi-res graphics and animation
- Sensational space sound effects
- 100% Machine Language
- Joystick required

The aliens will materialize from hyperspace, at first, only a few at a time . . . then more . . . and more . . .

. . . for your Preschooler



PreReader

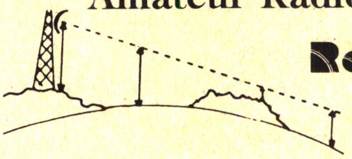
Level I - your child will work with colors, shapes, numbers, capital letters and small letters

Level II - your child will learn to associate individual letters and consonant blends with the sounds they make

Songs and happy faces for each correct answer!

32K ECB; Joystick Required
Tape - $19.95; Disk - $24.95

. . . for the Amateur Radio Enthusiast



Radio System Design Calculations

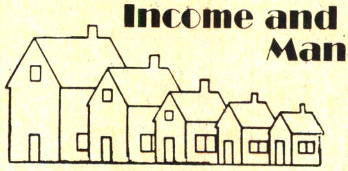
Helps design or evaluate:

- Land mobile radio systems
- Satellite TV
- Satellite data acquisition systems
- Aircraft radio systems
- Microwave systems
- Microvolt/DBM conversions
- Frequency/Wave length conversions
- System received signal levels
- Gain of parabolic antenna
- Propogation Calculations

32K ECB
$29.95 - Tape
$32.95 - Disk

. . . for the Rental Property Manager

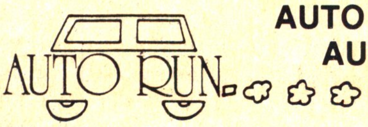
Rental Property Income and Expense Management Package



Disk - $34.95
32K Required

- Keeps track of all your rental properties
- Provides instant screen or printer summary of all your properties
- Maintains and prints a detailed, itemized listing of each of 28 expense categories
- Gives you a schedule of the Accelerated Cost Recovery System depreciation allowed for each tax year for 3, 5, 10 and 15 year property

. . . for the Programmer in the Family



AUTO RUN 64 - $24.95
AUTO RUN - $19.95
Tape

- Creates a ML loader which automatically starts up your Basic or ML program
- Title screen utility
- Provide an audio introduction
- Locates your program at the desired address

PIRATECTOR!™

You write the Basic or ML program. Piratector™:

- Supplies protection scheme
- Includes Semigraf graphics editor
- Incrementing serial numbers
- Many user subroutines included
- Effective against popular piracy/protection cracking programs

32K Disk
$99.95

Last Minute Gift?
Call (614) 861-0565 for Same Day Service.

We will include a gift card if you wish.

Sugar Software

Best Wishes for a Happy, Healthy Holiday Season from Sugar Software

We make all of our holiday greeting cards with

The CoCo Calligrapher

and so can you!

The CoCo Calligrapher works on these printers:

Epson: MX80, FX80, 100 (8 1/2 x 11 size only), and all models with graphtrax
Gemini: 10, 10X, 15, 15X (81/2 x 11 size only)
Radio Shack: LP7, LP8, DMP100, 110, 120, 200, 420, 510, 2100
Okidata: 92A - unless it is version 4. The ROM has a bug and the dealer should replace it for you.
Banana: Behaves like a Radio Shack
Prowriter: 8510

These type styles come on the CoCo Calligrapher program tape or disk:

Old English
Gay Nineties
Cartoon

Tape - $24.95
Disk - $29.95
Both require 32K ECB

These additional type styles are also available — **$19.95 each, or $49.95** for all on tape or disk.

Tape 1

Old English	Cartoon	Gay Nineties
Old English-reduced	Cartoon-reduced	Gay Nineties-reduced
Old English-reverse	Cartoon-reverse	Gay Nineties-reverse
Old English-reverse/reduced	Cartoon-reverse/reduced	Gay Nineties-reverse/reduced

Old English Cartoon Gay Nineties

Tape 2	Tape 3
Broadway	Business
Broadway	Business
Broadway	Business
Broadway-reduced	Business-reduced
Broadway-reverse	Business-reverse
Broadway-reverse/reduced	Business-reverse/reduced
Old Style	Antique
Old Style	Antique
Old Style	Antique
Old Style-reduced	Antique-reduced
Old Style-reverse	Antique-reverse
Old Style-reverse/reduced	Antique-reverse/reduced

Simplify all of your Holiday Mailing with TIMSMAIL

$19.95 - Tape
32K ECB
Disk
Compatible

- User friendly
- Detailed tutorial & guide
- No blank line!
- Send formatted file to tape, disk, or printer
- Upper and lower case
- Up to 230 characters per record

Address all your holiday greeting cards in minutes! Update your list in seconds!

- Designed for 80 column printers
- Continuous feed or single sheet labels
- 1, 2 or 3 labels wide
- 2.5, 2.75, 3, 3.5 and 4 inch labels
- Sort by zip code
- Sort by name
- Select records to print
- About 200 records will fit in 32K

Spend some quality time with your family and play Bible Stories Adventure

Tape -
16K ECB - $19.95
Disk -
32K ECB - $24.95

A very simple graphics adventure game for young children and their families.

All of these stories are included:

- Adam and Eve
- Noah's Ark
- Abraham and Isaac
- The Exodus
- David and Goliath

Intriguing sound effects. Exciting high-res graphics and animation. The one adventure game that's fun to play over and over again!

Disk software compatible with Radio Shack DOS only.
A complete catalog of other sweet Sugar Software products is available.

Dealer and author inquiries are always welcome. Canadian dealers should contact Kelly Software Distributors, Ltd., P.O. Box 11932, Edmonton, Alberta T5J-3L1 (403) 421-8003.

SUGAR SOFTWARE
2153 Leah Lane
Reynoldsburg, Ohio 43068
(614) 861-0565

No refunds or exchanges.

MasterCard VISA

Add $1.00 per tape for postage and handling. Ohioans add 5.5% sales tax. COD orders are welcome. CIS orders EMAIL to 70405, 1374. Dealer inquiries invited.

GTRM — A Good Text Screen Enhancer

Like many Color Computer users who decided to try the OS-9 operating system, I was amazed at its power and versatility. At the same time I felt that this remarkable operating system, running on a 64K CoCo with floppy drives, was like installing an aircraft engine on a chainsaw.

One of the reasons for feeling this way was the 32 x 16 text display which is standard on the CoCo. An expanded text screen program was the necessity that soon became the mother of invention for *GTRM*.

GTRM gives your CoCo, running under OS-9, 51 characters on 24 lines of very readable text. Besides the 6K needed for the high resolution text screen, only seven additional pages are required for the program. It should be noted here that under OS-9, one page of memory is 256 bytes, not the 1536-byte graphics page used in BASIC.

It's quite easy to include *GTRM* in your startup procedure file that is executed when OS-9 is being booted. Simple and easy instructions are provided for copying the program files from the disk supplied to the CMDS directory of your system disk. A demo program lets the program show you what kind of features it has.

The cursor may be changed from block to underline, and full movement in all directions is possible making it very handy for custom text editor programs. Reverse video blocks with text inside may be created anywhere on the screen to highlight menus or data displays. A window of protected area may be defined for text while using the other portion for graphics display.

Several new graphics commands are included to draw a line, create a box and start printing text at a specific screen location. The box command is especially handy for creating charts with a shading effect that is quite pleasing.

I try to avoid comparisons whenever I review programs, but in this case it seems appropriate. Another program for OS-9 that has an expanded text screen is O-PAK from FHL that I have been using for about six months. Both of these programs carry the same retail price tag of $34.95, yet O-PAK lets you change or refine the character set. Also, several utilities are included with O-PAK for file transfer between OS-9 and Disk BASIC. When comparing these two programs it would be fair to say that O-PAK is more versatile and gives more bang for the buck.

When judged on its own merits, however, *GTRM* is well written, easy to use and comes with documentation that is clear and concise.

(Dugger's Growing Systems, P.O. Box 305, Solana Beach, CA 92075, disk $34.95)

— J. Michael Nowicki

NEED AN INEXPENSIVE SERIAL-PARALLEL INTERFACE?

SP-2 INTERFACE for EPSON PRINTERS:

RAINBOW CERTIFICATION SEAL

- 300-19,200 BAUD rates
- Fits inside printer — No AC Plugs
- Optional external switch ($\$5^{00}$ extra) frees parallel port for use with other computers
- $\$49^{95}$ (plus $\$2^{00}$ shipping)

SP-3 INTERFACE for MOST OTHER PRINTERS:

- 300-19,200 BAUD rates
- External to printer — No AC Plugs
- Built in modem/printer switch—no need for Y-cables or plugging/unplugging cables
- $\$64^{5}$ (plus $\$2^{00}$ shipping)

Both also available for RS-232, Apple IIC and MacIntosh computers.
Co Co Serial Cables 15 ft.—$10.
Co Co/RS-232 Cables 15 ft.—$20. Other cables on request.

C N R ENGINEERING

P.O. Box 492
Piscataway, NJ 08854
(201) 752-0144

DEALER INQUIRIES INVITED!

EDUCATIONAL SOFTWARE

COINS $24.95
Counting coins,adding coins and making change.3 skill levels each.Summary after every five problems.High res. graphics.

ADDITION $24.95
8 levels-computer adjusts to student. Easy-to-read large numbers.Error correction and printable summary.Easy to use.

TIC-TAC $24.95
Answer (+,-,X) problems to win tic-tac-toe squares.3 time limits and incorrect answers gives the computer the square.

TEXT $24.95
Text writing for young children.large readable letters.Movable cursor for easy editing.3 screens of text.Save/load/print

ALL PROGRAMS ON CASSETTE
MINIMUM OF 16K EXTENDED BASIC
$24.95 EACH / 4 FOR $89.95
ADD $1.00 POSTAGE AND HANDLING
RI RESIDENTS ADD 6% SALES TAX
SEND CHECK OR MONEY ORDER TO:

WISH SOFTWARE
P.O. BOX 7366
JOHNSTON,RI 02919
(401) 232-2707

RAINBOW CERTIFICATION SEAL

Eat Those Dots And Have Some Fun With *Pattipak*

Pattipak is a clone of Pac-Man that's available on tape or disk. This review was done using the tape version which *CLOADed* the first time with no problems. Simple and complete instructions are provided and anyone who has ever played Pac-Man will get into it quickly.

The graphics are done in a low, but colorful resolution mode, and the quality approaches the arcade version. Each new round of play starts off with a catchy but unfamiliar tune.

The object of *Pattipak* is to gobble up as many dots as possible before being assaulted by the many ghosts chasing you.

There are eight levels of difficulty, and to make it a real challenge for arcade pros there is an invisible maze every fourth screen. In most Pac games the player is able to hide in the corners, but in *Pattipak* the ghosts continue to track you no matter where you are.

When you manage to clear a screen of all dots, you are rewarded with a very impressive fireworks display complete with explosion sound effects. The manual states there is another fireworks display after the third screen is cleared and intermission screens after screens two and four are cleared, but I never got past the second screen to see them.

Radio Shack's original joysticks for the CoCo were used for this review but they are notoriously inadequate for arcade game control. I did note some sluggishness in response with them but I'm sure, like many other CoCo arcade games, best performance can be achieved using self-centering arcade-type joysticks.

(Petrocci Freelance Associates, 651 N. Houghton Rd., Tucson, AZ 85748, tape $21.95, disk $26.95)

— Michael Nowicki

Quix Is A Quick, Strategic, Top-Notch Game

With the release of *Quix*, Tom Mix has once again taken an arcade favorite and put it into a version for the Color Computer. Although it is not exactly like the arcade game Qix, the play is the same.

You are a small diamond on the edge of a rectangular playing screen and your goal is to box in at least 75 percent of the screen by outlining boxes with your man. To make it a little harder, you can only move along the edge of a box. There is also a red line moving around the screen, this is the Quix. If it touches the outline of an unfinished box, you lose a man. There are also other enemies, and things to make it harder to stay alive; at higher levels, there are even two Quixes!

Quix is different from most of the other games I have seen. It has the combination of a fast, arcade pace, and the strategy of chess. You must watch where the Quix is (as well as all of the other nasties) while drawing a box, lest you lose a man. There is a fine line between a game being too easy and too hard. *Quix* rides right in the center of this line, being easy enough to get quick results, but hard enough to be challenging when you become an expert.

The directions are brief and concise, but all of the necessary information is there. I have never played the arcade predecessor of *Quix*, but I was able to start playing almost immediately. Nothing is left to the imagination in the directions. You are told how to get new men, how to load the tape or the disk, as well as what to expect on each level.

I would suggest this game to anyone who is willing to try something a little different. It is well done as are the other Tom Mix programs I have seen. *Quix* is a top-notch game.

(Tom Mix Software, 4285 Bradford N.E., Grand Rapids, MI 49506, tape $24.95, disk $27.95, joysticks are required)

— Lewis R. Jansen

Compugenesis
presents
"The CoCo Complete"
A Videotape for all CoCo users,
from beginner to advanced
90 minutes in color
Special Introductory Offer
Buy Now and Save!
$59.95—VHS and Beta II
$99.95—3/4"
plus $2.50 shipping and handling
NY residents add local sales tax

"The CoCo Complete" is for

Home and Office Use
- CoCo hardware and software demonstrations
- how to perform CoCo upgrades, maintenance
- hook up procedures
- all CoCo applications

Educators
- Classroom support package available, write for details

Foreign CoCo Users
- the tape is obtainable in any world standard, write for prices

Compugenesis
41-48 40th St. Sunnyside, NY 11104

Name ____
Address ____
City ____ State ____
Zip ____ ☐ VHS ☐ Beta ☐ 3/4"
☐ check or ☐ money order enclosed
Please allow 8-10 weeks for delivery.

Develop Programming Skills With *TRS-80 Color Computer And MC-10 Programs*

Radio Shack has always taken a lot of heat for their Color Computer instruction manuals. I think for the most part these manuals are well-written and the criticism comes from not being able to please everyone. There is one area in the manuals I feel is kind of weak; that is, the lack of practical programming applications and useful examples. A novice does not have to work with the manuals long before he is looking for some useful programs to work with while he develops his programming skills. If you are one of many faced with this situation, one avenue to consider is to pick up one of the growing selections of Color Computer programming books. That brings us to the topic of this review, which is a new book containing BASIC programs found on Radio Shack's shelves. *TRS-80 Color Computer And MC-10 Programs* is written by William Barden, Jr., the premier Color Computer teacher, programmer and writer.

The coverage of the Color Computer and the MC-10 (Microcolor Computer) in one book is a natural combination because Color BASIC and Microcolor BASIC have very similar dialects. There are very few dissimilarities and they are highlighted whenever encountered in any of the programs presented in this book. Note that the book concentrates on Color BASIC and does not use any of the powerful commands to be found in Extended Color BASIC. I'm sure that this was a conscious trade off made by the author wanting to aim his book at the novice-to-intermediate programmer. The book does take almost full advantage of one of the most feature-rich BASICs available in this market.

DATA'PHILE
207 Melrose Drive
North Syracuse, New York 13212
(315) 458-3410
THE EXCLUSIVE COLOR COMPUTER STORE
Proudly Presents

PAUSE CONTROL

===

This development adds new demensions to your Color Computer. The control allows you to stop the CPU dead in it's tracks. All operations are continued from their stopping point when released. All computer operations are supported (except cassette) including Disk in/out.

Now when the phone rings, you can put your game or other program operations on "hold" until you return to them- picking up where you left off. It can also be used for security, preventing unauthorized use of your computer; as well as many other uses.

The kit includes a fully assembled PAUSE CONTROL with complete documentation for installation (solderless connections). Kit installation takes about 15 minutes and anyone can do it. The case must be opened for installation and it works with all versions of the color computer.

The kit is fully tested and has been submited to RAINBOW for certification.

$19.95 Check or Money order

****

THE DATA'PHILE deals exclusivly in the Color Computer. We serve the entire New York State area, but can meet your needs wherever you live. We sell the following fine products:

FRANK HOGG FLEX
COMPUTERWARE
VIP SOFTLAW
PRICKLY PEAR
MARK DATA
TOM MIX
FUTUREHOUSE
TELEWRITER 64
DISKS
J&M CONTROLLERS
OKIDATA PRINTERS
TEAC & SHUGART DRIVES
COLOR & MONO MONITORS
CUSTOM PROGRAMMING
BASIC CLASSES
ASSEMBLY CLASSES
MAGAZINES
DISK CLEANERS

Our objectives are service, honesty and personal attention. Our success depends on customer satisfaction. We are in constant development of new products for the color computer. Pricelist included with order.

The book has 184 pages packed with a variety of programs of all types — educational, games, math, practical, music, business and others; 40 programs in all. Some alone may be worth the price of the book. As examples, there are: a detailed amortization schedule program with output to either the screen or printer, a perpetual calendar program, a mailing label program, an ohms law calculator, a BASIC word processor and many, many more. If you are considering this book, pick it up and leaf through the table of contents; there should be something for almost everyone. The programs in this book are mostly designed for a 4K system. In fact, all but three will run in 4K of memory. The compactness of the programs do not distract from their usefulness.

This book, which is a compendium of useful programs, can be helpful to those learning programming but can be used by anyone interested in obtaining inexpensive software for their computer. The style used in the book concentrates on presenting the programs with a brief tutorial on how they work. Each program includes a background section describing the particular algorithm or basis for the program as well as a section of special notes detailing the hardware requirements. Differences between the Color Computer version and the MC-10 version are clearly described and sample printouts and screen displays are often included. This technique used to present the programs is very effective. I should also point out that this book uses actual reproductions of the program listings rather than typeset listings. This results in a much more accurate listing and obviously much less frustration.

My only complaint about the book is minor. The Color Computer and MC-10 have the capability of storing data on tape but this is only used in one program, the word processor. All other programs using data rely on embedded data statements. This method is much simpler but does not allow full advantage of the computer system of which cassette storage is a working part. With embedded data you are limited to the memory capacity of the computer. With tape data storage you are theoretically limited to the length of tape available for storage (megabytes). I believe that some of the programs could have benefited from tape storage.

Overall, my impressions of this book are good. There is an excellent variety of useful programs presented in an easy to read and understand style. The author is one of the most renowned programmers and authors in his field; you couldn't find a much better source. I recommend *TRS-80 Color Computer And MC-10 Programs* to any novice to Color Computing or anyone looking to beef up his Color library. The price is definitely right and the book is as near as the nearest Radio Shack store.

(Radio Shack stores nationwide, $5.95)

— Tom Szlucha

Assembler Language Programming Toolkit — A Powerful Debugger

By Stuart Hawkinson

The Freeware concept seems to be catching on all over the country. I recently attended a software festival in Portland, Ore., where noted Apple author Paul Lutus donated a diskette of software to festival goers. Now the CoCo Freeware Clearinghouse has come out with a new freeware offering. *The Assembler Language Programming Toolkit (ALPT)* includes an Editor/Assembler for machine language programming and a Monitor/Disassembler for debugging machine language programs.

The *ALPT* provides a suitable set of tools for learning machine language (ML) programming. In conjunction with a book such as Bill Barden's *TRS-80 Color Computer Assembly Language Programming* from Radio Shack, you have a good beginning. The *ALPT* package is not compatible with Radio Shack's *EDTASM+*, nor is it as complete. But that may not be important while you are learning to write ML programs. Your first efforts will be short practice pieces. After you gain more experience, you will want to graduate to a more powerful, faster package.

The Editor/Assembler part of the package enables you to write assembler mnemonics using a full screen editor and then assemble the program into machine language instructions (hexadecimal bytes). The editor is specifically geared to assembly language programming. It features defined fields for labels and assembler op-codes (ML instructions). The assembler uses the source code produced by the editor and transforms these instructions into machine language object code.

The Monitor/Disassembler reads the object code file and allows you to debug the program in a very controlled environment. You can step through the program execution, instruction by instruction. The monitor shows you the contents of the microprocessor's registers at each step. You can change registers and memory at will, as well as jump to new sections of code. The disassembler feature allows you to examine the machine language code by showing the corresponding assembler mnemonics.

After your program is debugged, the monitor can save a copy of the machine code in the standard Radio Shack format as a binary file. This version of the machine language program can then be loaded and executed normally using the *LOADM* (disk) or *CLOADM* (tape) command followed by the *EXEC* command.

The BASIC programs are supplied on either tape or disk. Send the CoCo Freeware Clearinghouse a blank disk or tape and a self-addressed mailer with return postage. After you have tried it out, you may send a contribution. The instructions for the package are supplied as a program which prints a seven-page document. You simply run the first program *FREE301A* to obtain the listing.

The rest of the package is provided in two program segments, *FREE301B* (Editor/Assembler) and *FREE301C* (Monitor/Disassembler). A fourth program, *FREE301D* on the disk version, can be used as a convenient menu-driven

MASTER KEY
© 1984

*** INTRODUCTORY OFFER ***

$99.95

Have you ever lost a program and didn't have a backup? Sooner or later it happens to everyone. The best policy is to have a backup of EVERYTHING. Thus comes the problem - many programs are copy-protected and won't backup easily. So how do you protect your investment?

The MASTER KEY was developed just for this problem. Just as a master key unlocks all doors in a building, this MASTER KEY will unlock ALL programs that load into your CoCo's memory. And it's as easy as flipping a switch! Once you have control, you can copy your programs, proctected or not, to tape or disk. The MASTER KEY offer's:

- Complete Disassembler
- Display/Change memory in Hex or ASCII
- View memory in all Graphic Modes
- Versatile printer routine for All printers
- Rom-Pak model has gold contacts for more reliable operation.
- Comprehensive, easy to follow manual
- Search for text or M/L routines
- Copy memory from one location to another
- Write memory to tape or disk
- Defeats All auto-start programs
- Rom-Pak design allows use of disk system while Master Key is installed.
- Works with all versions of CoCo, 16K+

The MASTER KEY may be used to convert many programs from tape to disk, and yet does not require a background in assembly language. Using the METHODS section of the manual will allow even a novice to copy many programs. As you learn more about assembly language, you'll be able to use the MASTER KEY's full capabilities.

You can leave the MASTER KEY plugged in all of the time. The gold contacts will improve the I/O of your disk drive, and at the flip of a switch you'll have a quality disassembler. The Examine/Change feature will allow the entry of short M/L routines, and the Screen command will allow quick debugging of graphic screens.

30 DAY MONEY BACK GUARANTEE: If you find any program that MASTER KEY cannot take control of, simply return for a full refund.

NOTICE: The MASTER KEY has been developed as an educational tool and to allow the user to examine and save for archival purposes programs he/she has purchased.

NOTE: "F" board owners must cut a capacitor - details included.

SUPPLIED ON ROM PAK MODEL #MK035

BACK IT UP!

SUPER BACK-UP UTILITY©

SUPER BACK-UP UTILITY WILL PERFORM ALL OF THE FOLLOWING FUNCTIONS:

1. **TAPE TO TAPE** (Regardless of most protection schemes!)
2. **TAPE TO DISK** (Move Cassette programs to Disk!)
3. **AUTO RELOCATE** (For those Cassette programs that conflict WITH Disk operating systems.)
4. **DISK TO TAPE** (Place Disk programs onto Cassette)
5. **DISK TO DISK** (Our powerful Spit-N-Image Program. *Regardless of protection schemes!)

- **MENU DRIVEN!**
- **REQUIRES 32K EXTENDED COCO**
- **REQUIRES 1 OR 2 DRIVES** (For Disk Functions)
- **ALL MACHINE LANGUAGE!!!**

COMPARE WITH OTHER INDIVIDUAL PROGRAMS COSTING IN EXCESS OF $100.00 OR MORE!!!

★★★ONLY $49.95!★★★
(SUPPLIED ON DISK)

T.T.U. - TRIPLE TRANSFER UTILITY (C)

M/L For Cassette & Disk Program Transfer

Transfer contents of disk to tape • Transfer content of tape to disk • "Select" or "All" Option • Will automatically relocate those cassette programs that conflict with the disk operating system! • Will display machine language program address • Copies ASCII, Basic, & Machine Language Programs • All contained in 1 menu driven program!!!

RAINBOW

REQUIRES 32K CC EXT.

Cassette $19.95 Disk $24.95

SPIT-N-IMAGE (C)

RAINBOW

M/L Disk Back-Up Utility

There is no need to suffer the heartbreak of crashed disks any longer. Spit-N-Image will create a mirror image of your valuable disk programs which do not respond to normal back-up functions. Will also initialize and back-up in one pass. Data processing experts always insist on haviang a back-up – it's good practice – Don't wait!

REQUIRES 32K CC AND 1 OR MORE DRIVES

DISKETTE $34.95

COMPUTIZE, INC
215-946-7260
P.O. BOX 207
LANGHORNE, PA 19047
Check or M.O
PA Res. add 6% sales tax
ADD $3.00 S/H

program loader. I renamed this program "MENU" to make operation simpler.

The full screen editor has commands to insert, delete, and renumber (duplicate lines). You copy to new lines by overtyping an existing line number. This creates a copy of the current line with the new line number. You move a line by first copying to a new line number, then deleting the old line.

The arrow keys provide full screen cursor control. Various shift combinations move the cursor to the start of a page or exit the editor. The CLEAR key moves the cursor to the next op-code field. The editor has very slow keyboard response, so you must type at a slow, measured pace. You are limited to the screen width for program lines, and comments must be placed on separate lines.

After entering your program, you may save the source as an ASCII file to either tape or disk. The editor uses the default extension "SRC" to indicate a source file.

The assembler takes the source code from memory and performs a two-pass assembly. This operation, in BASIC, is much slower than if the assembler were written in machine language. The assembler also has some syntax restrictions. Not all the standard mnemonics are supported. For example, PC relative addresses are referred to as 'P' rather than 'PCR', while the direct page register is referred to as 'Q' rather than 'DPR'. No index arithmetic or label offsets are supported.

Since the editor uses the shifted arrow keys to move the cursor, the assembler must refer to indirect addresses with parentheses rather than square brackets (SHIFT-right arrow and SHIFT-down arrow). These differences force you to be very careful when entering programs from published listings.

You must also be aware of the limitations of the assembler's output and error messages. You cannot get a directly executable file from the assembler. The object code file (default extension 'OBJ') must be read into memory by the monitor program. Also, the assembler doesn't produce a symbol table, which is useful for debugging. The error messages are limited to four cryptic statements.

The slow assembly is monitored by a moving bar at the bottom of the screen. This performance monitor tells you how far the assembly has progressed, showing you that the program is still working, and hasn't "gone away" due to a programming error.

The Monitor/Disassembler loads assembled programs and allows running the program in a very controlled manner. It also displays the program by disassembling the machine codes to assembler mnemonics. This makes debugging and tracing program flow much easier.

The monitor displays registers and memory, and allows both to be easily changed. The display for the condition register, CC, would be more useful if each bit were displayed. The CC register has five condition bits (negative, carry, etc.) interspersed with three interrupt control bits. Separating them would make debugging much simpler.

One monitor command displays a HELP screen with short descriptions of all the commands. Normal address and memory input is given in decimal. The documentation fails to mention that you can specify hexadecimal input by using the "&H" prefix. The displays from the monitor are a mixture of Hex and decimal values. It would be much better to uniformly provide hexadecimal input and output. The beginner would learn to use this important mode much faster.

The programs you load and debug using *ALPT* must be located at address 30000 (7530 Hex) and above. This limit stems from the monitor program using the lower 30K of the 32K system. If your program uses graphics pages, you must limit the program to four pages (one Hi-Res screen) due to memory constraints.

Besides the restrictions on memory mentioned above, the editor restricts the size of program that can be assembled. The assembler also has some address or mnemonic restrictions. The slow editor keyboard response seriously limits typing speed for experienced computerists.

I found several syntax errors in the monitor program. These appear to arise mainly from eliminating blanks in the program. Six corrections are needed:

Line 190: add space in phrase 'SB=M1 ELSE'
Line 200: add space in 'AR=M1 ELSE'
Line 380: add space in 'PW=PP TO'
Line 820: add space to 'K=M1 TO'
Line 900: add space to 'POKEM1,N ELSE'
Line 1820: add '<I' after J in 'IF J<I OR K<I'

I was also puzzled by the 'SA', set argument command. Nothing describes it in the documentation.

The *ALPT* package provides a good set of BASIC programs for introducing assembly language. You may soon graduate to a full featured *EDTASM* if you write assembler programs of any length.

The Freeware concept has produced another good program for the Color Computer enthusiast. I hope there will be many more to follow.

(The CoCo Freeware Clearinghouse, P.O. Box 1084, Morgantown, WV, send tape or disk and SASE, contributions accepted)

---

* * LOCAL * IN * LOS * ANGELES * LOCAL * IN * LOS * ANGELES * LOCAL * IN * LOS * ANGELES * *

LOS * ANGELES *

*** SOFTWARE ***

Green Mountain Micro!!
Computerware (All)
Custom Software (No Disc.)
Frank Hogg Labs (OS-9 & Flex)
Key Color Software (Key 264K)
Tom Mix (All)
Moreton Bay (More)
Prickly Pear (Colorkit!)
Platinum Software (!)
Softlaw (VIP & Colorquest)
Speech Systems (All)
Sugar Software & (Super)
and Much More.

We are a discount house—Call.

Happy EDC Holidays!

*** E.D.C. INDUSTRIES ***
Software • Hardware • Support
Educational • Small Business • Games
VOICE (213) 254-6809 10 A.M.-10 P.M.
BBS (213) 258-0640 24 HRS.
300 and 1200 Baud
Extended Hours+Call before coming.
6130 YORK BOULEVARD
(Near North Figueroa St.)
POST OFFICE BOX 42718
LOS ANGELES, CA. 90050

★ DECEMBER SPECIALS ★

Amdek Dble. Drives	$369.00
VIP Library	Less 10%
ROM Y Cables	$26.95
Graphicom	$24.95
Worlds of Flight (Mix)	Less 15%

We now stock Tandon & Teac Drives.

See us for:

PBH
Hayes
Interfaces
Speech
Elephant
Gemini
Controllers
Music

ALWAYS MORE AND BETTER
CALL US LAST!

LOS * ANGELES *

* * LOCAL * IN * LOS * ANGELES * LOCAL * IN * LOS * ANGELES * LOCAL * IN * LOS * ANGELES * *

For Fast, Flexible, Sophisticated Database Management, There's *Elite*File*

By Ed Lowe

To support my computing habit I spend most of my day managing the operations division of a company which specializes in training people in both the public and private sectors on how to best use microcomputer personal productivity software on IBM PCs and similar computers.

On the most-wanted list is a system called *dBASE II* (and its follow-on *dBASE III*), perhaps the most widely used database management system (DBMS) for the microcomputer. It is also one of the hardest to master without constant practice and use. At least half a dozen books have made it to the top by explaining this system in terms that the lay user can easily grasp. It takes quite a while to make use of its powerful features.

A database is a collection of data on disk, organized to provide easy access by people and computer programs. A DBMS, then, is a set of programs controlling access to the database.

According to a recent issue of *PC Magazine*, "Databases generally fall into three categories: hierarchical, network, and relational. The first two are usually found on mainframe computers and minicomputers and are designed to handle very large applications.

"Relational databases . . . are less complex in design and are easier for most people to grasp conceptually."

The simplest DBMS is a file management system that stores data in individual files made up of records and fields and containing a description of each field and one or more indexes to keep the file in order by key fields. The file management structure is ideally suited for terminal entry and has certain other unique characteristics. BASIC data files don't fall into this category.

*Elite*File*, a relational DBMS, is the third of Elite Software's trilogy of applications packages for the Color Computer. It needs a minimum of 32K with one drive and is completely interactive with the other two: *Elite*Word*, the word processor, and *Elite*Calc*, their spreadsheet offering. In my opinion, it offers power and features comparable to *dBASE II* in many respects, even though on a smaller scale. When we consider the cost of a 64K CoCo and a DBMS such as *Elite*File* (now $259.95 and $74.50 respectively) compared to that of an IBM PC and *dBASE II* (roughly $3,000 plus $400), we have an unsurpassed bargain for both personal and small business database management of almost any kind.

I was very impressed by *Elite*File's* file handling capacity. I think most of us would be hard-pressed to exceed its handling limits under most circumstances. Consider the following:

File Handling Capacities

Feature	Elite*File	dBASE II
Max records per file	4000*	65535
Max fields per record	255	32 normally
Max characters per file	a disk-full	65,535,000
Max characters per record	2000	1000
Max characters per field	255	254
Max characters per field name	125	10
Field types	**Character	Char/numb /logical
Max Files open at once	16	2

Figure 1. Structure limits of *Elite*File* and dBASE II

(*Theoretical. Actual size is calculated by dividing max available disk space by number of characters in file's definition.

**String values are automatically converted to numerical data when needed, although the user must be aware of specific needs.)

These comparisons with *dBASE II* are simply to establish a point of departure. We aren't likely to see *dBASE II* on a non-CP/M CoCo in our lifetime, I'm sure! But not to worry, as long as we keep getting the likes of *Elite*File*. The latter doesn't have a lot of bells and whistles, but it'll get the job done well both at home and in the shop. So let's now concentrate on *Elite*File* itself.

(When I use "easy" in this review, it is because *Elite*File* is easy to use — although, as the manual says, you can't "fake" it; and it's the easiest one with such power I've come across yet.)

I won't itemize its features because they are well enumerated in Elite Software's ad in the pages of this magazine. Still, I cannot see a single advertised claim that I would label as mere hype. I've had a chance to exercise the majority of the features more than once and can report that, except for a few instances when I had to go back and dig around in the manual to check a procedure, I encountered little difficulty. That is not to say that their manual wins all blue ribbons for clarity and style. The system itself saves the documentation. But more about that later.

A Standardized Data Format

Data format is interactive with both *Elite*Word* and *Elite*Calc* in that text and data can be passed among the three. Would that they could all reside in memory at the same time and pass parameters back and forth! I did not have *Elite*Calc* to interact with, but *Elite*Word* proved easy to use with *Elite*File* and vice versa. Its data files may easily be read using Disk BASIC's direct access I/O structure and the steps outlined in the manual. (See Listing 1 for a routine I used to prove it to myself.)

No Disk Swapping

*Elite*File* is written entirely in machine language, except for a small loader which sets up the CoCo for work. All of the system resides in memory, so single drive users can insert a data disk after booting the system and forget about any disk swaps. I must admit, though, that I seldom remembered to remove the system disk and insert the data disk before starting to work!

Menu driven, it offers lots of handholding and error trapping features to prevent your bombing out. In fact, it is very hard, as far as I can tell, to bust the program. I did discover a minor irritant: my right pinkie has a tendency to want to come down between the hyphen and BREAK keys. On a couple of occasions the BREAK key won the tag, automatically aborted record entry, and I was summarily returned to the main menu. No harm was done, however, since files are closed upon return to the main menu. It just made me gun-shy.

Error messages (in CoCo's now infamous mnemonic format) are displayed momentarily, and in most instances you are returned to a selection menu to correct your option or data input with no program interruption. All menu selections and prompts are clear and to the point. Selections are all made with single keystrokes.

The Same Old Characters

Perhaps I'm getting spoiled, but I did not anticipate *Elite*File's* use of CoCo's built-in character set and its 32 x 16 text display. I had expected it to have its own character generator to put more information on the screen at a time. Perhaps we'll see future versions so equipped. Many serious users have upgraded to monitors capable of displaying much more than 32 x 16. Perhaps speed and RAM were the author's primary concerns.

Defining The File Structure

The most important step in setting up a database file is carefully planning the actual file structure. This normally involves determining the fields needed and naming them, the type of information to be entered into each field, and the width or maximum number of characters each field should hold to effectively handle all of your data. After you have entered data into it, you cannot easily change or modify that structure without losing all of your data. Plan carefully before executing.

Even so, defining a file's structure should be simple (easy?) with *Elite*File* — perhaps even deceptively so. Simply give each field a name and separate that from the width by a colon and you're off and running. Only character fields are accepted, so you don't have to fret about numerical or logical fields. Its simplicity cannot be overstated, believe me, but you must plan ahead to avoid wasting time trying to get it right. *Elite*File* will keep track of the complete file structure from that point on. Before actually entering data into the first record, you may modify the structure as often as you want until you get it just like you want it. If you later decide the structure still doesn't fit your needs, you can copy it to a new file, add, modify or delete fields, and then transfer or "refile" the data into the new file.

One of the databases I created is for a product search designed to provide information on hardware and software products available for the CoCo. It mirrors one I maintain for the IBM PC and PC*jr* on *dBASE II*. Figure 2 lists its structure which, had I not been investigating, should have taken no more than 30 minutes at best, start to finish.

Format Reports

After you've defined a file's structure, you must format reports to route selected data to the screen or printer. Such a report may be generated in either the "command mode" for simple needs or through structured programs for more fixed needs. Using *Elite*File's* programming language should be easy. It follows today's trend toward plain English command words. You'll find yourself experimenting somewhat to get the desired outcome, because the manual skimped a bit in providing enough in-depth examples to enhance the learning and using process here. The system has enough flexibility to deliver almost any kind of report you'll need at any printed width you specify.

There are provisions for including a header title in a formated report. Its limit is 50 characters, a limit not mentioned in the manual.

Another very important feature which could benefit from more clarity is the CALCulation function. When trying to calculate the three formulas in Figure 3, I consistently got a Syntax Error ("SN IN CALC") until it dawned on me that only one calculation may be placed on a line unless separated by colons. This function, too, is not sufficiently explained in the manual.

Figures 2 and 3 show a programmed report format file written using *Elite*Word*, and a resulting sample printout.

The Documentation

As with all software review assignments, I found myself paying particular attention to the accompanying documentation to determine if it clearly and adequately supports and explains the various features of the system.

*Elite*File's* documentation gets an adequate rating. On a scale of one to five, that translates to three stars. Basically, they seem to have tried to compress it too much and as a result do not give examples and expansions of features with enough depth in several cases. The user finds himself experimenting, for example with the reports formatting parameters to get a firm handle on them. If you're really serious, though, that can be an excellent learning technique.

The manual is divided up into three user parts: general, advanced, and expert. The intent is good. The general user section will get you started with a database today. Learn more and embellish on what you've got. I like that idea. I found myself reading the whole thing several times before starting the programming phase.

A newcomer to the CoCo can make use of *Elite*File* and get very usable results. An experienced user with a good grasp of programming can really make it sing. In trying to wring it out, I found myself trying all sorts of things and then checking the manual to see what it said. (Without an index, that can be slow!) Most of the time it's there.

I like *Elite*File* and would readily recommend it to anyone needing a good, fast, flexible, basically uncomplicated yet sophisticated DBMS. Its power and speed have to be seen to be appreciated.

(Elite Software, Box 11224, Pittsburgh, PA 15238, minimum 32K Disk BASIC, $74.50 plus $2.50 S/H)

FLORIDA
SEARCH NO LONGER!
The Software Connection of
Fort Lauderdale is your one stop source
for your Color Computer Software,
Peripherals, Books, Magazines & Repairs

THE SOFTWARE
CONNECTION, INC.
4301 N. State Rd. 7
Lauderdale Lakes, FL 33319
(305) 484-7547

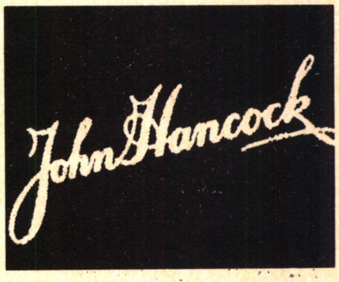
DIGISECTOR™ DS-69 VIDEO DIGITIZER FOR THE COCO

Give your COCO the gift of sight!
The Micro Works is happy to introduce the newest member of our Digisector™ family — the DS-69 Video Digitizer for your COCO. It has all the standard features of its big brothers but comes with a price tag that's right for you.

- **High Resolution** 256 by 256 spatial resolution.
- **Precision** 64 levels of grey scale.
- **SPEED!** ½ second for a full screen of video.
- **Compactness** Self contained in a plug in Rompack.
- **Ease of Use** Software on disk will get you up and running fast!

The DS-69 Digisector opens up a whole new world for you and your COCO. Your computer can be a security system, take portraits, analyze signatures, inspect assembly work . . . the DS-69 is your COCO's eyes. Use the DS-69 and a TV camera to get fast, precise conversion of video signals into digital data.

Powerful C-SEE™ software.
C-See is a menu-driven software package included with your DS-69. It provides high speed 5 level digitizing to the screen, high precision 16 level digitizing for superb hard copy printout, and simple software control of brightness and contrast. Or call our driver routines from your own Basic program for easy 64 level random access digitizing. Pictures taken by the DS-69 may be saved on disk by C-See and then edited by our optional MAGIGRAPH package for enhancements and special effects.



The DS-69 comes with a one year warranty. C-See supports both cassette and disk operation with the Multi-Pak adaptor and requires 64K. Cameras and other accessories are available from The Micro Works. Let your COCO see the World!

■ DS-69 Digisector & C-See Software	$149.95
■ MAGIGRAPH Graphics Package on disk	$ 39.95

Terms: Visa, Mastercard, Check or C.O.D.

Purveyors of Fine Video Digitizers Since 1977.

The MICRO WORKS
Established 1977

P.O. Box 1110 Del Mar, CA 92014 (619) 942-2400

Hockey Fans Will Love *Ice Hockey*

Quick now, what is it that brings out the fanatical qualities of Canadians and people who live in the major cities of the eastern United States?

If you guessed the Color Computer, you're not wrong. But the answer we were looking for was ice hockey, because this happens to be a review of a new game recently released by Computerware called *Ice Hockey*.

Hockey fans of both countries will love this version. It is of arcade quality, complete with hockey stick-equipped players, a lively puck, nine levels of challenge and lots of realistic offense and defense.

A dramatic opening gives you the option of playing the national anthem of the United States or Canada, with the flag of the designated country displayed while the music is played.

You have a choice of one or two players. If one is selected, you play against the computer, which in this case, is a very capable opponent. You have two players on your team, each of whom is expected to be equally as good on offense and defense. Their success, of course, depends upon your prowess with the joystick.

The game is divided into two 10-minute halves, with a short musical intermission between play.

The scores are displayed at the top of the screen, with the team possessing the puck constantly updated as the game progresses.

Graphics, sound and challenge are all superior in this tremendous demonstration of how a fast-paced sports game can be handled and still retain the suspenseful and skillful elements that make it a traditional favorite. As in any arcade-type game, it takes awhile to master the joysticks, so expect some high-scoring games for awhile. When you get the defense down pat, the scores become more realistic.

The only problem I have with the program is that there doesn't appear to be any way to make a backup copy.

If you like hockey or sports games, good arcade games that demonstrate CoCo's full potential, or are just a parent who wants to keep junior busy, *Ice Hockey* belongs in your library.

(Computerware, P.O. Box 668, Encinitas, CA 92024, tape $24.95, disk $27.95)

— Charles Springer

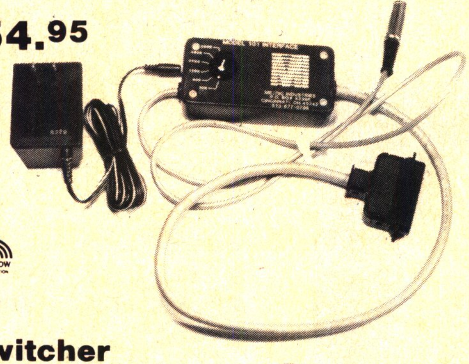
RAINBOWfest
Chicago
May 17-19

Metric Industries

For the color computer and TDP100

Model 101 Interface $54.95

- Serial to Parallel Interface
- Works with any Centronics Compatible Printer including Radio Shack, TDP, Gemini, Epson, Gorillia and many others
- Six switch selectable baud rates (300 to 9600)
- 90 day warranty
- Power Supply included



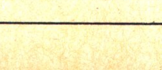
Model 102 RS-232-C Switcher

$35.95

- Switches all three data lines
- Indicator lights let you know computer is on
- 3 position switch has silver plated contacts for high reliability
- Color coded lights indicate switch position
- Color coded labels for your printer, modem etc., supplied

Cassette Label Program $6.95

- Prints five lines of information on pin-feed cassette labels
- Menu driven — easy to use



- Uses special features of your printer for standard, expanded and condensed characters
- 24 free labels included with program
- Auto centering features for each line of text
- 16K ECB required

General Items

- Gemini 10X Printer **$319.00**
- Special Save — Printer & Interface **$360.00**
- C-10 Cassettes **$7.50/dozen**
- Hard plastic boxes **$2.50/dozen**
- Pin-feed Cassette labels **$3.00 per 100**
- Free shipping on all orders over $50.00
- Add $3.00 for shipping on orders under $50.00
- Ohio residents add 5.5% sales tax
- Phone order line for VISA and MASTERCARD, orders accepted 24 hrs. a day, call **513-677-0796** or send check or money order to:

Metric Industries
Department R
P.O. Box 42396
Cincinnati, OH 45242

Dealer Inquiries Invited

Finding A Wealth Of CoCo Knowledge In Rainbow Hints

By Joseph Kolar
Rainbow Contributing Editor

Hints and suggestions are strange coin of the realm. They have different value to different people. Some hints are worth a small fortune in computer time to some individuals. Some hints are gimmicky and worth nickels and dimes. Some hints are quite valueless. But, the person who fails to stoop down to inspect the hints and walks on by might just as well kick THE RAINBOW aside.

THE RAINBOW is chock full of useful information worth scooping up and being stored in the vaults of your bank of computer knowledge. There are piles of "coins" waiting for you. It is up to you to gather in the loot.

This article is more blatant about it. You will find a flea market offering of various coins. Some hints will be useful. Pocket them! Some will surely be useless. Pick them up and pass them to the needy newcomer, who hasn't discovered the pot of gold called THE RAINBOW. Browse through the hints at your leisure and say to yourself, "Now, why didn't I think of that? Let me try it out and see if it works for me."

Looking into my secret vault for the "gold coin" that has reaped dividends for me, I can find none that outmatch the one I will grudgingly offer you.

Newcomers are blessed with varied typing techniques and abilities. Each newcomer brings his special style with him. Most beginners are neither expert typists nor unable to type text with at least one or two fingers. The first order of business for the newcomer is to copy listings.

The big problem confronting people new to computing is the confusion of the new computer vocabulary that makes up a listing. Their big woe is being unable to keep their place in a listing. They are forever losing their place and dropping to the next line or skipping part of a line.

As major an irritation as that may be, we all make peace with ourselves and devise some method that suits us well to cope with this annoyance. Soon enough, we are typing the listings but at a price. We are making all kinds of errors. Copying a listing is very demanding and must be done exactly as listed.

Many experts advocate looking at the listing and not sneaking peeks at the screen. Wrong! It is better to watch the characters as they appear on the screen and sneak peeks at the listing.

The experts will scoff at this bit of wisdom. They wouldn't be experts if they didn't scoff. But, as newcomers, follow this line of reasoning:

Copying a listing is very demanding work. A comma instead of a period may give you an error message. A zero instead of an O or a one instead of an I will do the same. Other errors will be more insidious and cause much text-listing comparing. Now, if you watch the screen as you copy, you can watch the characters that appear on the screen. Many errors are due to incorrect fingering and can be corrected immediately. Taking a quick peek at the listing will verify if what you typed is what the listing called for. The key word is immediately. You correct your typing mistakes as you are keying in the listing.

I have found by watching the characters appear on the screen that it is fun and very satisfying to correct any error before it goes too far. After changing over to the fascinating 'see what you are typing' routine, about 85 percent of my errors are remedied before I even try that first tentative run of the completed listing.

Quite often, depending on the program, you can pause and *RUN* what

---

(Joseph Kolar is a free-lance writer and programmer dedicated to proselytizing for computers in general, and the CoCo specifically.)

you have copied so far. If you get error messages (such as SN), *LIST* the program line, and correct the error. *RUN* again and if you get 'OK', the computer is satisfied with what you keyed in. That is not to say that all errors are eliminated. You can also clear up a lot of TM or FC Errors in this manner.

Sometimes, on these trial test runs, you may get UL because a program line, usually containing a *GOTO* or *GOSUB*, references a higher line number you hadn't reached yet. As a newcomer, you can't win them all. There are ways to get around this but not in the scope of this article. You could *RUNx* where *x* is the next line number.

This is merely a "starter" to set you on the road. The only way to develop your own system is the old fashioned way, hard work and much practice.

The second most useful hint is old-hat to most programmers. Make frequent copies of work in progress. After keying in some lines, make a copy and take a breather. This insures that all the trouble you have gone through to trap errors is not in vain. It doesn't make sense to search for mistakes only to lose the program.

The third most useful hint is to save all your working tapes. File them away! The only time you will want to refer to them is five minutes after you erase them.

Mr. Allen W. Stuart, Jacksonville Beach, Fla., offers the following hint:

If you are having trouble locating the blank space in front of the beginning of a listing on your tape, (to avoid sitting on top of the listing and getting the I/O Error) simply run the tape near the end of the preceding program. Type *AUDIO ON* ENTER *MOTOR ON* ENTER and any letter (don't ENTER). You will hear the precise end of the preceding program. Now, ENTER and you will get an error message, but you will be right on target for the desired location.

Mr. W.P. Frame, Hershey, Neb., had a problem with his CTR-80A. The PLAY key was slipping. I quote, "I took off the back and took a piece of fine sandpaper, cut about ¼" wide and threaded it up between the button and the bail, held down the button and pulled out the sandpaper. After about five passes, I had restored the hook in the button that held it to the bail. It worked!"

Mr. Ahsan A. Akmal, Chicora, Pa., offers a simple, inexpensive hint; easy to implement that does not harm or disfigure the CoCo. He had a problem in keeping his fingers on the home keys of his new CoCo 2 typewriter keyboard. He used a label-maker, punched out two dots (he used the period), and used a paper punch to make neat, round dots. He affixed one dot on the 'F' key and the other on the 'J' key. Upon further experimentation, he put a pip on the '2' key to locate the quote mark, on the '4' key for that ubiquitous $; on the minus key to locate the minus and equal sign; on the left arrow to avoid hitting the CLEAR key when reaching for the back space.

Mr. Chuck Ziehl, Lockport, N.Y., reports that he was using a 'D' board CoCo that would go to garbage after a half to one hour. He investigated and traced the problem to the SAM chip and heat sinked it to the RF shield. He successfully took a ⅜" thick by ½" wide by 2" long piece of aluminum and using lots of heat transfer paste, placed it on the SAM chip and screwed the heat sink to the RF shield with one screw.

On another note, Mr. Norman Wong, Nanaimo, British Columbia, offers, "Instead of *140 IF INKEY$ ="" THEN 140*, which waits until the user presses a key, one can use *140 EXEC&HA171.*

Aurora Computing

49 Brookland Ave., Aurora, Ontario Canada L4G 2H6

FAMILY GAMES

The popular **STOCKBROKER** and **CRIBBAGE 32K** .... $14.95 each.

ADVENTURE GAMES: Sea Quest and Shenanigans from MARK DATA .... only $24.95(C); $27.95(D) each

From BRANTEX, **PIRATE TREASURE 16K** $13.95

SCAVENGER HUNT 16K $18.95

EDUCATIONAL GAMES

COLORMIND, CONCEN - improve your memory and logical thinking - **16K** .... $10.95 each

• • •

Also from **BRANTEX**

EDU-COMBO (Math Derby, Peek 'N' Spell Metric Converter) **16K** .... only $29.95

BUSINESS: **HOUSEHOLD EXPENSE MANAGER 16K** $19.95

LOAN ANALYSIS 16K $20.95

• • •

NEW from **MARK DATA**

The amazing **TIME FIGHTER 16K** .... $24.95(C)
32K .... $27.95(D)

Also the ever popular **GLAXXONS 16K** .... $24.95(C)
32K .... $27.95(D)

• • •

UTILITIES: **ROMDISK:** Run your rom pack games from a disk! **64K** $15.95

MR. COPY - make up to 99 copies of one program at once! **16K** $15.95

THE SOFT SHOP

"For all your personal computer needs"

64K Ram Chip Set .... $ 55.95
HJL-57 Keyboard Kit 75.95
Prowriter Printer (8510A) w/Interface 419.95

-- ARCADE ACTION --

		TAPE	**DISK**
King Tut (Tom Mix)	(16K)	25.95	28.95
The King (Tom Mix)	(32K)	23.95	--
Pooyan (Datasoft)	(32K)	26.95	29.95
CU*BER (Tom Mix)	(32K)	25.95	28.95
Draconian	(32K)	25.95	28.95
The Touchstone	(32K)	25.95	28.95
Crash	(32K)	23.95	26.96

**** BUY 2 GET 1 AT 1/2 PRICE ****

**** For the Serious User ****

		TAPE	**DISK**
Basic09 (Requires OS-9)	(64K)	--	89.95
VIP Writer w/Speller (Softlaw)	(32K)	**	65.95
VIP Terminal (Softlaw)	(16K)	**	45.95
VIP CALC (Softlaw)	(32K)	**	65.95

**** - Tape Version Included**

Call or write for a catalog
Call our BBS on-line from 10 p.m. to 7 a.m. EDT!
Phone (803) 288-0613

Terms: Money Orders and Personal Checks welcome (Please allow an additional 3 weeks for personal checks.) S.C. Residents add 5% sales tax. (All Funds U.S. DOLLARS Please.)
Shipping: $3.00 for Software, 3% for Hardware.
C.O.D.: Please add $3.00 (No COD's outside the continental US and Canada!)
Blue Label: Add $4.00
Handling: Handling Charges will be added to orders outside the continental U.S. (Minimum $5.00)

VISA and MASTERCARD ACCEPTED.

THE SOFT SHOP
P.O. Box 878 Mauldin, S.C. 29662
10 a.m. (803) 297-1067 8 p.m.

The advantage of the latter is that it uses up less memory; it does not terminate the program if the user presses the BREAK key and it displays a cursor while it is waiting thus indicating that the computer is not hung up."

Women have a penchant for copying recipes on file cards and storing them away in a plastic file-card holder. Mrs. Betty White, Kirkland, Wash., reports that she copies vital information about BASIC statements and functions onto 3″ x 5″ file cards, adding notes that may be useful. When she is working on a program, she yanks the appropriate recipe for easy completion. Naturally, the card file is easily stored.

Another innovation she reports is that she ripped out the *PRINT@* worksheet from the "Getting Ahead With Extended Color BASIC" manual; glued it onto a heavy cardboard backing and covered it with a transparency from an overhead projector. A grease pencil is used to design and locate graphics when using *PRINT@* locations on the transparency. Erasures are made with tissue.

If any reader has some hint they find useful, you may want to share your innovation with other struggling newcomers. Keep in mind the fact that the hint must be readily understood by a newcomer. If you have a hint for advanced users, send it to the RAINBOW's "Letters to the Editor" column.

Newcomers, take a few minutes to key in the listing to find out what you should be looking for when thumbing through THE RAINBOW.

```
140 ....... 169
END ...... 206
```

```
0 '<SOA>
10 '(C) 1984, J. KOLAR
20 PMODE2:PCLS:PMODE4
30 A=170:B=118:P=3.88
40 DIM J(2)
50 DRAW"BM90,0F2ND4R4NE2D4NF2L4N
G2BEU2R2D2L2"
60 GET(90,0)-(98,9),J,G
70 PCLS:SCREEN1,1
80 FOR R=90 TO 60STEP-15
90 FOR Z=2000 TO 1748 STEP-6:C=S
IN(TAN(C))
100 C=SQR(Z)+P
110 X=INT(A-6+R*SIN(C)):Y=INT(B-
6+R*COS(C))
120 PUT(X-38,Y-10)-(X-34,Y-2),J,
PSET:SOUND45,1:NEXTZ,R
130 FOR S=1TO2:FOR Q=1 TO 5:PUT(
124,70)-(132,78),J,PRESET:FORT=1
TO50:NEXT
140 PUT(124,70)-(132,78),J,PSET
150 SOUND10,2:SOUND100,1:NEXTQ
160 PLAY"V15O3L8DFGGL4DDL8CO2BFB
O3DV20L16DEDEGDO2CBL8O3CCL4EC":P
LAY"P2V15L16EGEGDDEEP16EGEGEEAAP
16L8BO4CEO3L2CL8DGBBL4GDL2C"
170 NEXT S
180 LINE(124,70)-(132,78),PRESET
,BF
190 DRAW"S8BM82,120U6R4D4L2NL2F2
BR3 U6R4D4NL4D2BR3 NU6BR3 U5NUF4
NU5DBR3 U6R4D2NL4D4NL4BR3 NU6R4U
6NL4BR3 D6E3F3NU6"
200 DRAW"BM52,145NR4U6R4BR3NR4D2
NR3D4R4BR3 U6R4D4L2NL2F2BR5U6NL2
R2BR3D6 BR3U4NR3U2R4BR3D6BR3NR4U
6R4BR3ND6R4D4NL4D2BR5U6NL2R2BR3D
6BR3NR4U6R4D6BR3U5NUF4NU5D"
210 DRAW"BM102,166R4U3L4U3R4BR3N
R4D2NR3D4R4BR3U6R4D4NL4D2BR3NU6R
4"
220 GOTO 220
```

fss

FOUR STAR SOFTWARE

GALACTIC FIGHTER

A fast-paced arcade game with great graphics and sound. CoCo at its best!

Save earth by fighting your way to Dracoz, the home world of the invaders. Fly earth's secret weapon, 'The Galactic Fighter'. Overcome alien ships, missiles and meteor showers. Try and survive the deadly laser trench.

32K, one joystick required.

CASS. $19.95 (U.S.)	**$24.95 (CDN.)**
DISK $24.95 (U.S.)	**$29.95 (CDN.)**

Write for free catalogue
Dealer enquiries welcome
Overseas orders add 10%

COCO PAINT

A very advanced, easy-to-use graphics development system for a 64K, single-drive CoCo!!

- Supports: keyboard, single joystick, mouse or X-pad
- Mix graphics and text, using built-in or user-definable characters and textures
- Create stamps: rotate, mirror, shrink, expand or invert
- Screen dump to most common printers
- 300 — 1200 baud modem communications capabilites
- Plus many more excellent features

DISK $39.95 (U.S.) **$49.95 (CDN.)**

P.O. BOX 730
STREETSVILLE, ONTARIO
CANADA
L5M 2C2

BUGS II

An adventure game with all the excitement of arcade action.

Earth is infested with intelligent killer bugs. Find your way through the maze and destroy their reactor. However, you must fight the bugs all the way!

New and improved version of the game that won the Color Computer Magazine® programming contest. 64K required.

CASS. $19.95 (U.S.)	**$24.95 (CDN.)**
DISK $26.95 (U.S.)	**$32.95 (CDN.)**

Cheque or Money Order

Add $2.50 shipping
Ont. Residents add 7% tax

DATAMAN
INTERNATIONAL

DISK MASTER

AT LAST all the disk utilities you have been looking for have been collected into one easy to use, menu driven package. If you need to create auto start programs, back up your directories, verify disk sectors, recover lost files, view and modify disk contents or many other tasks, you will find our new DISKMASTER indespensible. The extensive instructions include a tutorial on disk structure. Includes 3 ring binder.

Tape	Disk	
Not available	$33.95 US $39.95 Cdn	+ $2.50 S/H

PRINT MASTER

COMING SOON - Our screen print program will work with any printer. All standard graphic and text screens are supported with a wide assortment of scaling factors, density options and special effects. Available Jan 1st. 1985

Tape	Disk	
$33.95 US $39.95 Cdn	$37.95 US $43.95 Cdn	+ $2.50 S/H

VISA

MC

IN ASSEMBLY LANGUAGE

Have you been trying to learn assembly language? Has EDTASM got you confused? Are you familiar with the 6809 instruction set, but you're still not able to put it all together into a coherant working program. If you answered YES then you need *IN ASSEMBLY LANGUAGE*. From simple routines to read the keyboard, generate random numbers etc. all the way to multitasking and threaded code are covered. All source code for the examples is included on tape or disk.

Tape	Disk	
$25.95 US $29.95 Cdn	$29.95 US $33.95 Cdn	+ $2.50 S/H

DATAMAN
INTERNATIONAL
125 SOUTH FIFTH STREET
LEWISTON, N.Y. 14092

DATAMAN
INTERNATIONAL
420 FERGUSON AVE. N.
HAMILTON,ONT.,L8L 4Y9

BYTE MASTER

16K ECB

Expand your CoCo text display . . .

Introducing Screen 51

By R. Bartly Betts
Rainbow Contributing Editor
with Programs by Chris Bone

As an introduction to this month's column, I would like to draw your attention to an innovation. You will be finding notes I call "Byte Master Bits," which are short explanations of new concepts. I think they will make communications easier.

First, I would like to say thanks to the many who have taken the trouble to call or write Chris and me. Knowing the popularity of THE RAINBOW, I knew there were lots of readers out there, but it is great to get a chance to meet some of you, if only by letter or phone.

Second, regarding letters, there have been some major changes in my life and one of them is my address. If you want to contact either Chris or me, please write to:

R. Bartly Betts / Chris Bone
2251 Lipscomb
Fort Worth, TX 76110
Phone (817) 924-3725 (please don't phone collect)

The Stars At Night

Yes, my love of the Color Computer finally drove me to the ends of the earth. I left the beautiful 65 to 75 degree weather of southern Canada to come to Texas, where every day is determined to outdo the previous day's 100-plus degree weather. Luckily Radio Shack took pity on my CoCo plight and gave me a job as a technical writer — and I love it.

I guess Radio Shack also feels I might work better as part of a team. Even as I write this, co-author Chris Bone is also wending his way to the Texas plains. He is joining Radio Shack as a technical researcher (that means he looks for technical errors in the Tandy manuals). We will be working in the same department while he pursues his scholastic studies. You can contact Chris by writing to my address until he has a permanent one.

Getting Things Straight

Speaking of teams, it seems that I didn't do well on my own. Chris has found some errors in the last column: these occurred while he wasn't here to correct me. As well, there are a couple of places where I failed to get the correct version of a listing into the program. Aside from the regular material, I hope to clear up some of these problems this month.

To begin, I mixed up some of the information on indexes and accumulators. My explanations were right but some of the examples I gave were wrong. Following are the examples the way they should be. We have also added other examples to help clarify how you can use registers to manipulate data. The following examples deal with the use of the comma, pound sign, dollar sign, plus sign and minus sign in assembly language source listings.

The first three items of each line give a sample assembly language listing. The remainder of the line is an explanation of what the listing does.

0010 LDA ,X Loads A register with the value in memory location pointed to by register B.

0020 LDA ,X+ Same as above but adds one to X upon completion of the operation.

0030 LDA ,-X Subtracts one from register X then loads the A

(Bartly Betts is a former reporter, magazine editor and store owner now residing in Fort Worth, Texas. He has owned and operated a Color Computer for over three years and is presently taking an electronics and computer course by correspondence. Chris Bone is a college computer science major and has been programming for more than three years. He averages between six and nine hours a day on the CoCo.)

register from the memory location indicated by the new X.

0040 LDA 4,X Loads the A register from memory four bytes past the location indicated by register X. Register X is not changed.

330 LDA #10 Loads decimal 10 into register A.

0040 LDA #$10 Loads Hex 10 into register A.

0050 LDA $10 Loads register A with the value contained in memory location Hex 10.

0060 LDA 10 Same as line 0050 but loads from memory location decimal 10.

There were a few other problems but they didn't take quite as much explanation and so they are included at the end of the program.

Introducing Screen 51

Now to get on with this month's work. This is the month we will provide the first installment of the 51-column text generator mentioned in previous issues. In order to give you the best chance of understanding how it works, I am presenting it in installments. This allows more details on how it operates. I know that can be frustrating for those who are only interested in the program and not how it operates but, after all, the purpose of this column is to teach you to write your own programs. Presenting a bit at a time, so you can see how the sections work, will help you do this.

> ***"The Most Significant Byte is the first byte in a hexadecimal number. The Least Significant Byte is the second byte in a Hex number."***

First Some Homework

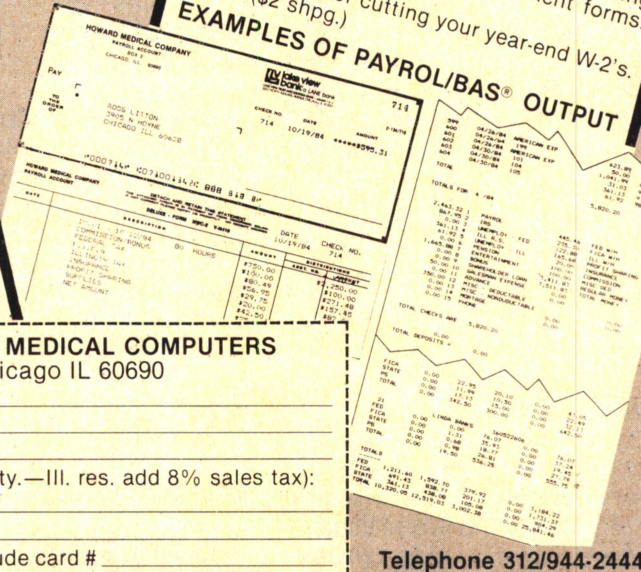
Before delving into the program, however, let's see if we can clear up a few more mysteries. Below is a chart showing all of your computer's registers with a brief description of them. You might want to keep it as a reference.

Register	Size	Purpose and Special Features
A	8 bits	Accumulator - MSB for register D
B	8 bits	Accumulator - LSB for register D
D	16 bits	Double accumulator - A combination of A and B
X	16 bits	Index Register
Y	16 bits	Index Register
U	16 bits	User Stack Pointer (also index register)
S	16 bits	A stack used to hold return addresses or for temporary storage.
DP	8 bits	Direct Page register -provides MSB for direct page operations
CC	8 bits	Condition Code Register - holds status flags of operations

MSB refers to Most Significant Byte
LSB refers to Least Significant Byte

Byte Master Bit 1

Now is probably a good time to explain about Most Significant Bytes and Least Significant Bytes. The only problem is that there is really nothing to explain. As you already know, a byte is two hexadecimal numbers, like 3F. The Most Significant Byte is the first byte in



HOWARD PRODUCT NEWS

December!

COMPLETE PAYROL/BAS®

Ready to run on a system with 64K Extended Basic (w/printer and one disk drive), Howard Payrol/BAS® has everything you need to do payroll for a business of up to 20 employees, including:

Entering employee information: name, address, SS#, wages or salary, starting date, year-to-date earnings.

Summary program: monthly listing of all checks' gross income, FICA, taxes, profit sharing, insurance.

Cutting checks: usable with either pin-feed or friction-feed printers. (We can supply checks.)

We don't leave you alone out there, either! An order puts you on our list for quarterly updates of tax information, etc.

Complete price
$79.95
($2 shpg.)

Other Helpful Programs

941 Program: gives individual summaries (and totals) of check information for preparing federal 941 and state unemployment forms. **$29.95** ($2 shpg.)

W-2 Program: for cutting your year-end W-2's. **$29.95** ($2 shpg.)

EXAMPLES OF PAYROL/BAS® OUTPUT

SEND TO: HOWARD MEDICAL COMPUTERS
Box 2, Chicago IL 60690
Name ____________________
Address ____________________
City, State, Zip ____________________
Please send (desc. & qty.—Ill. res. add 8% sales tax):
____
____
AMERICAN EXPRESS MasterCard VISA include card # ____________________
exp. date ____________________
DEALER INQUIRIES INVITED RB1284a

HOWARD MEDICAL

Telephone 312/944-2444
Computer Bulletin Board
312/278-9513

a hexadecimal number. The Least Significant Byte is the second byte in a Hex number. In the number 3F4C, 3F is the Most Significant Byte and 4C is the Least Significant Byte.

You probably will be pleased to discover that the previous chart illustrated most of what you will need to know about the 6809 registers. The registers seemed complicated to me at first, but when I finally listed them all together, a lot of the mystery cleared up.

A and B are the registers used the most. When a 16-bit operation is required, they can be combined and are called register D. You will soon be learning about indexed addressing with registers X and Y; it isn't complicated. Register U serves a dual purpose and can be used like registers X and Y as well as used to keep track of a stack you set up in memory. Register S operates the same as register U except that it is also used by your computer's CPU to store addresses for returns from subroutines.

Byte Master Bit 2

A stack is a data structure or storage location that follows the rule of "first in last out." In other words, when you put data onto a stack, it piles up like a stack of blocks. When you pull data from the stack, the last data (block) you put on the stack is the first to be pulled.

The following diagram demonstrates how a stack works. It assumes that the U register has been loaded with the value of $3F00.

Operation	Stack Value	U Points At
LDA 43		
PUSU A	43	3EFF
LDA 12		
PUSU A	12	3EFE
LDA 10		
PUSU A	10	3EFD

Following these operations, U now points to the last entry on the stack, which is 10 and which is located in memory address $3EFD. If you now issued a PULU A command, the value to be pulled into register A would be 10.

I will be writing more about stacks in the future and you will get a much clearer picture when you see them in use.

The Direct Page register allows you to organize your computer into 256-byte blocks of memory called pages. You can then treat these pages as complete memory units. You will see from future examples just how handy this register can be. The DP register can be set to represent the Most Significant Byte of the address.

The Condition Code register is not really a register at all but a grouping of eight one-bit flags that are used to reflect the results of an arithmetic operation. To be technical, the CC register has five status flags, two interrupt control bits and one bit to tell the processor what to do with the registers when an interrupt occurs. If this means nothing at all to you, don't fret, such things will become clear as we continue.

How The Stack Stacks

The best way to clear the air is to give some examples. After you have loaded and executed your editor/assembler, type in the following program to further illustrate how data is pushed and pulled from a stack.

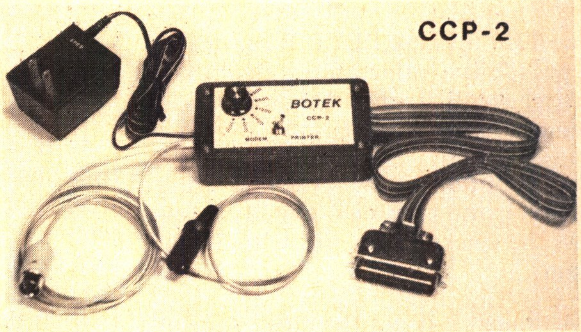
```
00010         ORG $3F80
00020 START   LDA #$12    *A=18
00030         LDB #$43    *B=67
00040         LDU #$3F00  *INIT USER
                          STACK TO
```

PARALLEL PRINTER INTERFACE

FOR THE RADIO SHACK COLOR COMPUTER

- Runs any parallel printer from the Color Computer serial I/O port.
- No hardware modifications or software patches needed. Works with all standard Color Computer commands including graphics.
- Switch selectable baud rates from 300 to 9600.
- All cables and connectors included.
- 1 year warranty.
- Most printers supply power at the parallel port. With these printers you may order your interface without the power module.
  (Printers known to require the power module are:
  Epson, Panasonic, and Mannesman Tally.)
- PRICE: Model CCP-2 with modem connector & switch------ $84.
  Model CCP-1 without modem connector & switch----$69.

  Either model without power module deduct-------- $3.
  Shipping costs included in price.
  Michigan residents add 4% sales tax.



CCP-1 OWNERS

UPGRADE YOUR CCP-1 TO A CCP-2 !!

Send us your CCP-1 plus $17 (includes shipping)
we will add the necessary cable and switch.

BOTEK INSTRUMENTS

313-739-2910 4949 HAMPSHIRE, UTICA, MICH., 48087 Dealer inquiries invited

```
                    &H3F00
00050       PSHU D  *PUT A AND B
                    ONTO THE USER
                    STACK
00060 * THE USER STACK NOW EQUALS
        #$3EFE
00070 * MEM LOC $3EFE CONTAINS 18
00080 * MEM LOC $3EFF CONTAINS 67
00090       PULU B
00100       PULU A
00110 * THE USER STACK NOW EQUALS
        #$3F00
00120       SWI
00130       END
```

Here is how it works:

Line 0010 sets the program origin at 3F80.

Line 0020 sets START as the label for the beginning of the program and loads register A with Hex 12 or decimal 18.

Line 0030 loads register B with Hex 43 or decimal 67.

Line 0040 loads register U with Hex 3F00. Because the register used is U, this command initializes a stack area at memory location 3F00.

As you know, register D is registers A and B combined. The Least Significant Byte, register B, is pushed on the stack first. The Most Significant Byte, register A, is pushed on last. Thus the value from register A is accessible first.

Register U always points to the last used memory location; it now points to value 3EFE.

Line 0090 uses the PULU B command to get the last value on the stack, $12 into register B. Register U now points to memory location 3EFF.

Line 00100 pulls the next value $43 from the stack into register A and, as U follows the stack, it now points to $3F00 again.

Although it is not the most efficient way to do it, the above routine accomplished a swap of the values in registers A and B, using registers A, B, D and U.

But What Is The Condition?

Although Condition Codes are a bit more confusing, they are going to be simpler to explain, mainly because I am going to do very little explaining. There is not a great deal you need to know about the CC register at this stage because, until we get into more complex programming, your assembler will handle keeping track of the flags for you. The following listing illustrates this.

```
0010 START      LDA #$12
0020            LDB #$43
0030            PSHS B
0040            CMPA ,S+
0050            BEQ EQUAL
0060            LDA #'N
0070            BRA STOP
0080 EQUAL      LDA #'E
0090 STOP       SWI
0100            END
```

Byte Master Bits 3

You will notice in the previous listing that instead of using the ASCII value of an alphabetic character, Chris uses the character itself, preceded by an apostrophe. This is perfectly legal and is a great shortcut.

Actually you can only see the operation of the Condition Code register in a roundabout way in this illustration. Here is how the program works:

Lines 0010 and 0020 load the A and B registers with $12 and $43. These numbers have no special significance.

Line 30 pushes the B register on the S register stack.

Line 40 compares the value in register A with the value now on the stack, then increments the S stack pointer by 1.

If the values are equal, Line 50 branches to Line 80 (label EQUAL) and register A is loaded with the ASCII value of E (for equal).

If the values are not equal (which is the case here) the program falls through to Line 60, loads register A with the ASCII value for N, for not equal, and stops.

As it is, the program does nothing visible but it could easily be expanded to accept input from the keyboard and compare the input with another value, then print whether the values are equal or not equal on the screen.

What does this have to do with the Condition Code register, you might ask. Well, the CMP (Compare) command actually subtracts the two values being compared but, rather than storing the result anywhere, it sets certain flags in the Condition Code register. These flags indicate whether the result of the comparison was equal or not equal. What does this mean to you? Mostly it means that you can forget about Condition Codes at this stage of your schooling. All you really need to know for now is that CMP can be used to compare two values.

Back To Basics And On To Screen 51

The next two listings are: 1) a huge data table in source code that contains the data to create the characters to be used by the program and; 2) a BASIC program to show you a little of how your 51-column screen program is going to work. You won't be able to do much with the listings this month but in the next column we will tie things together a bit more.

For now, enter the source code with your editor/assembler and save it to disk or tape. Also assemble the code to disk or tape and give it the name *SCREEN51/BIN*. If you don't know how to do this, check back issues of the "Byte Master" column.

Next, type in the following BASIC program, make sure it is correct and save it to disk or tape. Before you run the BASIC program, load *SCREEN51/BIN* into memory using the *LOADM* or *CLOADM* command. When you run the BASIC program it will put you into the graphics screen mode. Now when you type on the keyboard, you will see a new character set, with both upper- and lowercase letters.

Don't worry that typing is slow and awkward. This is because of the BASIC driver. When you have the rest of the program, it will handle any typing speed. All this program is suppose to do is give you a taste of what is to come.

I hope you submitted a solution to the challenge I issued last month. I haven't had time to receive any submissions yet; it will take two or three months before I can tell you of the results. This month you will have plenty to do just entering the source code data table.

The Character Set

The character set is just a big table of data that the program can refer to when it has to display a character on the screen.

Many schemes have been worked out to store such a table. The one presented here takes only half the space normally reserved but the program has to be just slightly larger and slower. It is a matter of sacrificing a few thousandths of a second to save hundreds of bytes.

Why 51 x 24? The answer lies in the size of the hires screen. The screen is 256 dots across so if each character is 4 dots wide and we put one blank dot between each letter then each character is 5 dots wide. Doing a bit of arithmetic gives 256/5=51.2. With that character width, only one dot is wasted. Then, the screen is 192 dots high. If each character is seven dots high, and one dot is used to separate each line, then each character is eight dots high. Some more arithmetic gives 192/8=24 so no dots are wasted.

Each character then can be represented as a grid four wide and eight deep, or 32 pixels which fit neatly into four bytes. Pretend we are going to figure out the data needed to represent the "<" symbol. First draw a 4 x 8 grid and shade in the symbol. The grid should now look like Figure 1. Using what we taught you in lesson one (Aug. 84) turn each one of those lines into a single hexadecimal digit (shaded=0, white=1) and write the digit next to the line it represents. The picture should now look like Figure 2. Each pair of digits can now be put into a single byte and you end up with a list of four bytes that looks like this, ED B7 BD EF. In more technical terms, each nibble represents a line. You get two lines to a byte or eight lines in four bytes.

Now type in Listing 1. Remember to save it as we will be adding to it over the next several months. Assemble it and save the output to tape or disk. To see what you did, go to BASIC and type in Listing 2. With the output of Listing 1 in memory, run Listing 2.

Figure 1

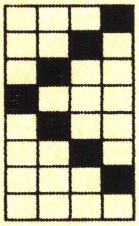
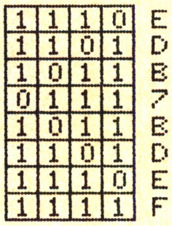


Figure 2



```
1110 E
1101 D
1011 B
0111 7
1011 B
1101 D
1110 E
1111 F
```

Listing 1

```
3E00             00010       ORG     $3E00
3E00     FFFF    00020 TABLE FDB     $FFFF
3E02     FFFF    00030       FDB     $FFFF
3E04     DDDD    00040       FDB     $DDDD
3E06     DFDF    00050       FDB     $DFDF
3E08     55FF    00060       FDB     $55FF
3E0A     FFFF    00070       FDB     $FFFF
3E0C     9909    00080       FDB     $9909
3E0E     099F    00090       FDB     $099F
3E10     B17B    00100       FDB     $B17B
3E12     D1BF    00110       FDB     $D1BF
3E14     F32D    00120       FDB     $F32D
3E16     B4CF    00130       FDB     $B4CF
3E18     B55B    00140       FDB     $B55B
3E1A     25AF    00150       FDB     $25AF
3E1C     DBFF    00160       FDB     $DBFF
3E1E     FFFF    00170       FDB     $FFFF
3E20     DB77    00180       FDB     $DB77
3E22     7BDF    00190       FDB     $7BDF
3E24     BDEE    00200       FDB     $BDEE
3E26     EDBF    00210       FDB     $EDBF
3E28     F690    00220       FDB     $F690
3E2A     96FF    00230       FDB     $96FF
3E2C     FBB1    00240       FDB     $FBB1
3E2E     BBFF    00250       FDB     $BBFF
3E30     FFFF    00260       FDB     $FFFF
3E32     9DBF    00270       FDB     $9DBF
3E34     FFF0    00280       FDB     $FFF0
3E36     FFFF    00290       FDB     $FFFF
3E38     FFFF    00300       FDB     $FFFF
3E3A     FDDF    00310       FDB     $FDDF
3E3C     FDDB    00320       FDB     $FDDB
3E3E     B77F    00330       FDB     $B77F
3E40     9640    00340       FDB     $9640
3E42     269F    00350       FDB     $269F
3E44     D9DD    00360       FDB     $D9DD
3E46     DD8F    00370       FDB     $DD8F
3E48     96ED    00380       FDB     $96ED
3E4A     B70F    00390       FDB     $B70F
3E4C     96E9    00400       FDB     $96E9
3E4E     E69F    00410       FDB     $E69F
3E50     D950    00420       FDB     $D950
3E52     DDDF    00430       FDB     $DDDF
3E54     071E    00440       FDB     $071E
3E56     E69F    00450       FDB     $E69F
3E58     DB71    00460       FDB     $DB71
3E5A     669F    00470       FDB     $669F
3E5C     0EED    00480       FDB     $0EED
3E5E     B77F    00490       FDB     $B77F
3E60     9669    00500       FDB     $9669
3E62     669F    00510       FDB     $669F
3E64     9668    00520       FDB     $9668
3E66     EDBF    00530       FDB     $EDBF
3E68     FDDF    00540       FDB     $FDDF
3E6A     DDFF    00550       FDB     $DDFF
3E6C     FDDF    00560       FDB     $FDDF
3E6E     DDBF    00570       FDB     $DDBF
3E70     EDB7    00580       FDB     $EDB7
3E72     BDEF    00590       FDB     $BDEF
3E74     FF0F    00600       FDB     $FF0F
3E76     0FFF    00610       FDB     $0FFF
3E78     7BDE    00620       FDB     $7BDE
3E7A     DB7F    00630       FDB     $DB7F
3E7C     96ED    00640       FDB     $96ED
3E7E     BFBF    00650       FDB     $BFBF
3E80     9642    00660       FDB     $9642
3E82     478F    00670       FDB     $478F
3E84     9660    00680       FDB     $9660
3E86     666F    00690       FDB     $666F
3E88     3551    00700       FDB     $3551
3E8A     661F    00710       FDB     $661F
3E8C     9677    00720       FDB     $9677
3E8E     769F    00730       FDB     $769F
3E90     1AAA    00740       FDB     $1AAA
3E92     AA1F    00750       FDB     $AA1F
3E94     0771    00760       FDB     $0771
3E96     770F    00770       FDB     $770F
```

```
3E98   0771   00780        FDB     $0771
3E9A   777F   00790        FDB     $777F
3E9C   9674   00800        FDB     $9674
3E9E   669F   00810        FDB     $669F
3EA0   6660   00820        FDB     $6660
3EA2   666F   00830        FDB     $666F
3EA4   8DDD   00840        FDB     $8DDD
3EA6   DD8F   00850        FDB     $DD8F
3EA8   CEEE   00860        FDB     $CEEE
3EAA   E69F   00870        FDB     $E69F
3EAC   6533   00880        FDB     $6533
3EAE   356F   00890        FDB     $356F
3EB0   7777   00900        FDB     $7777
3EB2   770F   00910        FDB     $770F
3EB4   6006   00920        FDB     $6006
3EB6   666F   00930        FDB     $666F
3EB8   6224   00940        FDB     $6224
3EBA   446F   00950        FDB     $446F
3EBC   9666   00960        FDB     $9666
3EBE   669F   00970        FDB     $669F
3EC0   1661   00980        FDB     $1661
3EC2   777F   00990        FDB     $777F
3EC4   9666   01000        FDB     $9666
3EC6   25AF   01010        FDB     $25AF
3EC8   1661   01020        FDB     $1661
3ECA   356F   01030        FDB     $356F
3ECC   9679   01040        FDB     $9679
3ECE   E69F   01050        FDB     $E69F
3ED0   0DDD   01060        FDB     $0DDD
3ED2   DDDF   01070        FDB     $DDDF
3ED4   6666   01080        FDB     $6666
3ED6   669F   01090        FDB     $669F
3ED8   6666   01100        FDB     $6666
3EDA   699F   01110        FDB     $699F
3EDC   6666   01120        FDB     $6666
3EDE   006F   01130        FDB     $006F
3EE0   6699   01140        FDB     $6699
3EE2   966F   01150        FDB     $966F
3EE4   6660   01160        FDB     $6660
3EE6   DDDF   01170        FDB     $DDDF
3EE8   0EC9   01180        FDB     $0EC9
3EEA   370F   01190        FDB     $370F
3EEC   8BBB   01200        FDB     $8BBB
3EEE   BB8F   01210        FDB     $BB8F
3EF0   F77B   01220        FDB     $F77B
3EF2   BDDF   01230        FDB     $BDDF
3EF4   1DDD   01240        FDB     $1DDD
3EF6   DD1F   01250        FDB     $DD1F
3EF8   B55F   01260        FDB     $B55F
3EFA   FFFF   01270        FDB     $FFFF
3EFC   FFFF   01280        FDB     $FFFF
3EFE   FF0F   01290        FDB     $FF0F
3F00   BDFF   01300        FDB     $BDFF
3F02   FFFF   01310        FDB     $FFFF
3F04   FF1E   01320        FDB     $FF1E
3F06   868F   01330        FDB     $868F
3F08   7771   01340        FDB     $7771
3F0A   661F   01350        FDB     $661F
```

```
3F0C   FF87   01360        FDB     $FF87
3F0E   778F   01370        FDB     $778F
3F10   EEE8   01380        FDB     $EEE8
3F12   668F   01390        FDB     $668F
3F14   FF96   01400        FDB     $FF96
3F16   079F   01410        FDB     $079F
3F18   DAB1   01420        FDB     $DAB1
3F1A   BBBF   01430        FDB     $BBBF
3F1C   F966   01440        FDB     $F966
3F1E   8E8F   01450        FDB     $8E8F
3F20   7716   01460        FDB     $7716
3F22   666F   01470        FDB     $666F
3F24   DF9D   01480        FDB     $DF9D
3F26   DD8F   01490        FDB     $DD8F
3F28   EFEE   01500        FDB     $EFEE
3F2A   E69F   01510        FDB     $E69F
3F2C   F764   01520        FDB     $F764
3F2E   166F   01530        FDB     $166F
3F30   3BBB   01540        FDB     $3BBB
3F32   BB1F   01550        FDB     $BB1F
3F34   FF60   01560        FDB     $FF60
3F36   666F   01570        FDB     $666F
3F38   FF16   01580        FDB     $FF16
3F3A   666F   01590        FDB     $666F
3F3C   FF96   01600        FDB     $FF96
3F3E   669F   01610        FDB     $669F
3F40   F166   01620        FDB     $F166
3F42   177F   01630        FDB     $177F
3F44   F866   01640        FDB     $F866
3F46   8EEF   01650        FDB     $8EEF
3F48   FF16   01660        FDB     $FF16
3F4A   777F   01670        FDB     $777F
3F4C   FF07   01680        FDB     $FF07
3F4E   0E0F   01690        FDB     $0E0F
3F50   BB1B   01700        FDB     $BB1B
3F52   BBBF   01710        FDB     $BBBF
3F54   FF66   01720        FDB     $FF66
3F56   669F   01730        FDB     $669F
3F58   FF66   01740        FDB     $FF66
3F5A   699F   01750        FDB     $699F
3F5C   FF66   01760        FDB     $FF66
3F5E   606F   01770        FDB     $606F
3F60   FF69   01780        FDB     $FF69
3F62   966F   01790        FDB     $966F
3F64   F666   01800        FDB     $F666
3F66   8E9F   01810        FDB     $8E9F
3F68   FF0E   01820        FDB     $FF0E
3F6A   DB0F   01830        FDB     $DB0F
       0000   01840        END
```

Listing 2

```
10 CLEAR1,&H3DFF:CLEAR300:PMODE4
,1:PCLS1:SCREEN1,1
20 C=PEEK(186)*256+PEEK(187)
30 A$="Type what you want!!"
40 FORN=1TO20
```

```
50 X=ASC(MID$(A$,N,1))-32
60 GOSUB150
70 NEXTN
80 C=C+236
90 A$=INKEY$:IFA$=""THEN90
100 X=ASC(A$)-32
110 IF X<0 OR X>90 THEN 90
120 GOSUB150
130 GOTO90
140 '***** OUTPUT CHR$(X)
150 Y=&H3E00+X*4
160 IF C-INT(C/256)*256=32 THEN
C=C+224
170 IF C=>PEEK(183)*256+PEEK(184
) THEN C=PEEK(186)*256+PEEK(187)
+256
180 FOR Z=Y TO Y+3
190 A=PEEK(Z)
200 A1=INT(A/16)
210 A2=A-A1*16
220 POKEC,A1+240
230 POKEC+32,A2+240
240 C=C+64
250 NEXTZ
260 C=C-255
270 RETURN
```

Last month I pulled the biggest blunder of "Byte Master's" short life. I had a perfectly good program running on my computer, but when it came to typing it into the column, I completely blew the job. Of course, the error was on one of the most obvious programs, the one I challenged you to complete. If anyone makes something out of the mess they deserve four of the nonexistent Byte Master Badges. Here is the program the way it should be. I apologize for the confusion.

```
0010 START      LDX     #$400
00020 LOOP      LDA     ,X
00030           CMPA    #'A
00040           BEQ     END
00050           LEAX    1,X
00060           BRA     LOOP
00070 END       SWI
00080           END
```

RAINBOWfest
Irvine
Feb. 15-17

triad pictures corp.
p.o. box 1299 sequim, wa 98382

INSTANT ANIMATION!
Create your own FULLY ANIMATED CARTOONS!

THE ANIMATOR puts YOU in command of a Hollywood style animation studio. Up to a minute-and-a-half of animation (over 600 frames)! 12 HELP screens! Full "cel" animation (as used by Disney) for smooth results! Includes an extensive manual and 3 cassettes. NO PROGRAMMING NECESSARY!
32K/EXT. 3-CASS. PKG. $35

ALPHABET STEW
Pre-schoolers command the computer!

Even kids as young as 18 months squeal with delight when the computer responds to THEIR touch! 70 different animated pictures & songs! Helps build KEYBOARD FAMILIARITY. Kids of all ages will use it for hours! 32K/EXT. CASS. $18

TRI-GRAF
Hi-res graphics at your fingertips!

Create "SLIDE-SHOWS" of unlimited length! Great for charts, lessons . . . any presentation! COPY feature for multiple images! Mix TEXT & GRAPHICS on the same screen! Automatic CIRCLES! Compatible with THE ANIMATOR!
16K/EXT. CASS. $16

SUPERFLASH & SPELLING LIST
Create YOUR OWN educational software!

SUPERFLASH lets you create up to 300 computerized super "flashcards". Use SPELLING LIST and your child's list from school to create personalized lessons. NO PROGRAMMING NECESSARY!
SUPERFLASH: 16 & 32K/EXT. CASS. $14
SPELLING LIST: 16K. EXT. CASS.$12
OR ORDER BOTH FOR ONLY $22!

* *

order form
Please send me:
________________ $ ______
________________ $ ______
________________ $ ______
________________ $ ______
Add $2 SHIPPING AND HANDLING .... $ ______
(3 or more - we pay s/h) TOTAL $ ______

name ________________
address ________________
city ________ state ____ zip ____

send this to:
TRIAD PICTURES
P.O. Box 1299
Sequim, WA 98362
(206) 683-6459

DISK TUTORIAL

32K DISK

This is the final installment of a series on creating a disk mailing list program

Developing A Database Manager

By Bill Nolan
Rainbow Contributing Editor

For several months now we have been exploring direct access disk files on the Color Computer, and we have been examining their use in a simple database manager program. In this column we have been working on a mailing list program that is as complete as some commercial offerings. The program is written in a modular style, with each section being testable separately. That way we can add a section each month and test it as though it were a small program by itself.

If you have been following the column you know that we have written all of the program except the sort section, and that will be added this month. If you have been typing in the program as we go along, the only lines you will need to type from this month's listing are those from 2000 to 2520.

Sorting is one of the most thorny problems to face database programmers on the Color Computer, and the reason for this is the limited amount of memory available on the machine. There are two ways to sort a disk file. You can sort it on the disk, or in memory.

(Bill Nolan, who teaches "Programming In BASIC" at the college level, owns Prickly-Pear Software Co. and has written several commercially successful software packages.)

Sorting in memory is the fastest way, but to do this you must have the entire file in memory all at once. Since each record in our file is about 100 bytes long, we can only fit 10 records per 1K of memory into the machine. Since we must have room in memory for our database program and the computer ROMs, and since we still need our screen memory and disk buffer space, we are limited to files containing only 100 or 150 records if we want to sort in memory. If our record length were longer, the number of records we could handle is even fewer.

If we choose to sort on the disk, then the number of records we can handle is limited only by the disk space, but we have a dramatic loss of speed. The simple method of sorting on the disk is to read two records into memory and compare them to see if they are in the proper order. If they are out of order, we exchange them and then write them back to the disk. Then the next pair of records is compared. This is called a bubble sort, and the other sorting methods are not that different. These methods use a great deal of disk access time, and are slow, and using machine language doesn't help very much, as machine language makes no difference in the disk access time.

We have a report from a man who had a very nice commercial database program, written in machine language, and he had about 800 records in his file. He told the program to sort them, and the drive started running. Over 30 hours later he turned the computer off, and the drive was still running!

There is a third choice in sorting, and it is a combination of the two methods above. What we will do is read only a part of each record into memory — the field we are sorting on. Then we will do the faster in-memory sort on just this part, compiling a directory of the record numbers in the order we want them. Then, after the in-memory portion of the sort is complete, we will create a new file named *TEMP.DAT* and read the records from the first file in the new order, putting them into the new file. Then we will kill the first file and rename the new file to the original name.

This sounds more complicated than it really is, as you will see, and with this method we will be able to sort a file of up to 400 records, and the sort will take minutes instead of hours. Let's start by looking at this section of the program line by line, starting at Line 2000.

Line 2000 clears the screen and asks the user which field they want used as the basis of the sort. For instance, you may want your file in alphabetical order by name, in ZIP code order, arranged state by state, and so on. The subroutine in Line 6500 is used to get the choice of field. Let's suppose that the user chose to sort by name (field 1).

Line 2010 prints the message "SORTING..." on the screen and goes to the subroutine at 5500 to open our file. Lines 2020 to 2040 form a loop that *GETs* each record from our file and stores the record number in the numeric array *ST*. At the same time, it stores the field we want to sort on in the string array *ST$*.

Lines 2050 to 2070 are the actual in-memory bubble sort (along with the subroutine at Lines 2500-2520). Line 2050 opens the loop. Line 2060 compares the two items, and if they are out of order, it goes to the subroutine at 2500. The subroutine at 2500 switches the position of the two items in the string array *ST$*, and also switches the corresponding record numbers in the array *ST*, as otherwise the record numbers would no longer be associated with the correct records. Line 2500 also sets a flag, FL, to indicate that the swap has been made. Line 2070 then closes the loop and checks the flag. If it is set the program goes back to 2050 and starts the process over. This continues until a complete pass is made through the arrays with no swaps being made, and Line 2080 then closes the file.

Lines 2050 to 2070 and the subroutine at lines 2500 to 2510 could be replaced by a machine language sorting routine if you have the inclination (and the skill). There have been routines like this published in RAINBOW, and some are commercially available.

Once the sort in these lines is complete, the items in the string array *ST$* will be in proper order, and the numeric array *ST* will contain all of the record numbers, also in proper order. The lines from 2100 to 2150 now read each record from the original file (in the order indicated in the array *ST*), and write them to the new file, *TEMP.DAT* Line 2130 checks to see if the field contains an up arrow.

This requires a little explanation. When we use the delete option during a search, the delete section at Line 3180 fills the record with up arrows. This symbol was used because, to the computer, an up arrow comes after all of the letters and numbers in alphabetical order. Thus, when a file is sorted, all of the deletes are moved to the end of the file. By checking for them, we can eliminate the deletes from the file completely and compress the file.

The loop that starts in 2120 and goes to 2150 will continue until all the records have been moved to the temporary file, or until a deleted record is found. When either of these happens, the sort is complete, and Line 2200 kills the unsorted file, renames the *TEMP.DAT* file to the original name, and returns to the main menu.

By the way, if you want a double sort, such as a file in ZIP code order that is also in alphabetical order by names within each ZIP code, just sort twice —once on each field. In the example of names and zip codes, sort by names, and then sort again by ZIP code.

As we have been developing the program, the operation of each section has been explained in detail, but these are all in different issues of THE RAINBOW. Now we will give some brief operating instructions all in one place.

"Sorting is one of the most thorny problems to face database programmers on the Color Computer, and the reason for this is the limited amount of memory available on the machine."

When you *RUN* the program, you will first be asked for the name of the file you want to work on. You can create different files under different names if you want to do so. If it is a new file, the program will tell you, and then it will ask you whether you want labels printed last name first or first name first. When you have indicated your preference, you will see the main menu. You have five choices on this menu, with the last being "end the program." Since that is self-explanatory, we will look at the "add records" option.

You will be asked for the name, address, city, state, ZIP code, and telephone number of each record you add. When you enter the name, remember to type the last name, then a comma, and the first name and middle name or initial. If there is a title that goes after

The RAINBOW

Back Issue Availability

Back copies of many issues of **THE RAINBOW** are still available.

All back issues sell for the single issue cover price. In addition, there is a $3.50 charge for the first issue, plus 50 cents for each additional issue, for postage and handling if sent by United Parcel Service. A $4 charge plus $1 each additional copy for orders sent U.S. Mail. UPS *will not* deliver to a post office box or to another country.

Issues July 1981 through June 1982 are available on white paper in a reprint form. All others are in regular magazine form. VISA, MasterCard and American Express accepted. Kentucky residents please add 5 percent state sales tax. We do not bill and no C.O.D. orders accepted.

Due to heavy demand, we suggest you order back issues you want now while supplies last.

To order, just fill out the form on the next page and mail it with your payment to:

THE RAINBOW
9529 U.S. Highway 42
P.O. Box 385
Prospect, KY 40059

BACK ISSUE ORDER FORM

☐ Please send me the following back issues:
(Payment must accompany back issue orders.)

NO.	MONTH YEAR		PRICE	
		VOLUME 1		
1	JULY '81	PREMIER ISSUE	$2.00	☐
2	AUG. '81		$2.00	☐
3	SEPT. '81	EDUCATION	$2.00	☐
4	OCT. '81	PRINTER	$2.00	☐
5	NOV. '81		$2.00	☐
6	DEC. '81	HOLIDAY	$2.00	☐
7	JAN. '82		$2.00	☐
8	FEB. '82		$2.00	☐
9	MAR. '82		$2.50	☐
10	APR. '82		$2.50	☐
12	JUNE '82		$2.50	☐
		VOLUME 2		
8	FEB. '83	BUSINESS	$2.95	☐
9	MAR. '83	NUCLEAR	$2.95	☐
10	APR. '83	SIMULATIONS	$2.95	☐
11	JUNE '83	PRINTERS	$2.95	☐
12	JULY '83	ANNIVERSARY	$2.95	☐
		VOLUME 3		
1	AUG. '83	GAMES	$2.95	☐
2	SEPT. '83	EDUCATION	$2.95	☐
3	OCT. '83	GRAPHICS	$3.95	☐
4	NOV. '83	DATA COMM.	$3.95	☐
5	DEC. '83	HOLIDAY	$3.95	☐
6	JAN. '84	BEGINNERS	$3.95	☐
7	FEB. '84	ADVENTURE	$3.95	☐
8	MAR. '84	BUSINESS	$3.95	☐
9	APR. '84	GAMING	$3.95	☐
10	MAY. '84	PRINTER	$3.95	☐
11	JUNE '84	MUSIC	$3.95	☐
12	JULY '84	ANNIVERSARY	$3.95	☐
		VOLUME 4		
1	AUG. '84	GAMES	$3.95	☐
2	SEPT. '84	EDUCATION	$3.95	☐
3	OCT. '84	GRAPHICS	$3.95	☐
4	NOV. '84	DATA COMM.	$3.95	☐
5	DEC. '84	HOLIDAY	$3.95	☐
		RAINBOW INDEX	$2.50	☐

TOTAL ____________
SHIPPING & HANDLING
U.P.S. CHARGE ____________
U.S. MAIL CHARGE ____________
KY RESIDENTS ONLY
ADD 5% ____________
TOTAL AMOUNT
ENCLOSED ____________

Name ____________
Address ____________
City ________ State ________ ZIP ________
☐ VISA ☐ MC ☐ AE
CARD # ____________
EXPIRATION DATE ________ PHONE # ________

the last name, put it before the comma. Do not put more than one comma in a record (you don't need any for business names). It should be done like this:

Nolan, William
Anderson M.D., Thomas J.
Norton's Office Supply
Jamison, Rev. Mary

The other thing to remember is to use the two-letter abbreviation for the state. When you are finished adding records, answer no to the question "want to add more?" and you will be back at the main menu.

The second choice on the main menu is the sort section, which we covered above, so we will go on to number three — the search section. Here you will be asked if you want matches to go to the printer automatically. If you answer yes to this, all matches will go to labels, and you can go away and let the program run. You will be asked for the field you want to search and what you are looking for. Partial matches will be found. For example, if you choose to search for names, and you search for "Robert," then Robert Smith, Janet Robertson, and Mike Roberts would all be matches.

If you didn't send the matches to the printer automatically, then every time a match is found the record will be printed on the screen and you will be given several options. "Print label" will do just that (be sure the printer is ready). "Next item" will continue the search, "Return to the main menu" will abort the search, and "Delete" and "Change" will let you delete or change the record on the screen.

The "Print records" option on the main menu is the other option with lots of choices. You will be asked whether you want to print on the screen, print on labels, print on the printer (on paper), or print a phone number list. These are mostly self-explanatory, so just choose the one you want. If you choose labels, the phone number will not be printed, and if you choose a phone number list, only the names and phone numbers will be printed on the printer.

Well, that about does it as far as instructions are concerned, and this was the last in the series about direct access disk files. Next month we will start with a new series of articles about the many string handling functions available on the Color Computer. You are fortunate to have a very complete and powerful set of these functions on your computer, and we will explore them in depth. The articles will focus on one or two functions each month, and we will include lots of examples and some very useful programs and routines. Have a happy and safe holiday season!

560	100
1200	185
2200	201
3170	212
3530	97
4240	245
5300	171
END	99

The listing:

```
10 CLS:GOTO 11000
20 CLEAR 15000
30 DIM ST$(400),ST(400),R$(6)
40 PRINT:PRINT" WORK ON WHICH FI
LE?":INPUT F$:GOSUB 5500:CLOSE #
1
50 IF LR<1 THEN PRINT:PRINT" THI
S IS A NEW FILE":PRINT:PLAY"AB":
GOSUB 7000
60 CLS:PRINT:PRINT"DO YOU WANT L
BELS PRINTED:":PRINT:PRINT" 1. L
AST NAME FIRST":PRINT" 2. FIRST
NAME FIRST":PRINT:PRINT"PLEASE S
ELECT 1 OR 2":K$=INKEY$
70 K$=INKEY$:LC=VAL(K$):IF LC<1
OR LC>2 THEN 70 ELSE SOUND 150,1
500 CLS
510 PRINT:PRINT"           MAIN
```

Metric Industries

For Your Color Computer I or II and TDP 100

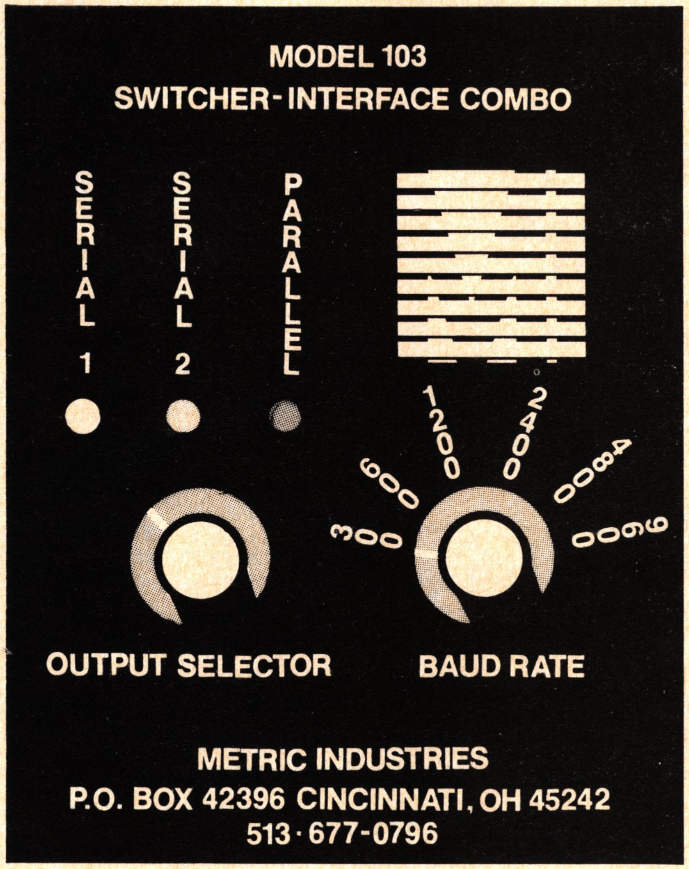
Model 103 Interface-Switcher Combo

Don't wear out the connectors on your computer, stop switching cables around — use the Model 103 and with just a turn of the knob switch your computer's RS232C serial port to any one of three outputs — two serial and one parallel.

The serial ports may be used for modems, serial printers or even another computer. The parallel port can be used with any "centronics" type printer.

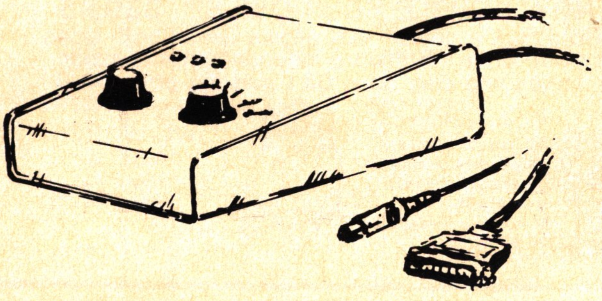
Features of the Model 103

- *Works with any level Coco Basic.*
- *Works with any color computer, 16K to 64K.*
- *Unleashes your printer allowing it to print it's maximum speed (up to 9600 BAUD).*
- *Indicator lights to show switch position.*
- *High quality electronic parts enlosed in a rugged anodized, heavy gage aluminum cabinet.*


MODEL 103
SWITCHER-INTERFACE COMBO
SERIAL 1
SERIAL 2
PARALLEL
300
600
1200
2400
4800
9600
OUTPUT SELECTOR
BAUD RATE
METRIC INDUSTRIES
P.O. BOX 42396 CINCINNATI, OH 45242
513-677-0796

- *Fully factory tested*
- *180 day warranty.*
- *Comes complete with "UL" listed power supply.*
- *3′ cable connects to your printer.*
- *2-½′ cable connects to your computer.*
- *Has non-slip rubber feet to protect your furniture.*

$85.95



Free shipping — Ohio customers add 5.5% sales tax.

24 hour phone order line for VISA MASTERCARD or C.O.D. orders. (C.O.D. orders add $2.00)

Send check or money orders to:

Metric Industries
P.O. Box 42396
Cincinnati, OH 45242

THE GRAPHICS PROGRAMS YOU'VE BEEN WAITING FOR!

BY
PAUL S. HOFFMAN

CREATE BEAUTIFUL PICTURES WITH

MASTER ARTIST

vers. 2.0

- Convenient, on-screen menu
- Accepts input from X-PAD, TOUCH-PAD, MOUSE or JOYSTICK
- Magnification mode
- Draw with custom paintbrushes
- Easy free-hand sketching
- "Paint" command
- 10 colors at a time
- Pictures are ready for use in BASIC programs
- Lettering in any size
- Screen dump to Color Ink-Jet or other Tandy printers

64K DISK	$29.95
32K DISK/TAPE (V.1.0)	$24.95

(some features not available on version 1.0)

COMBINE PICTURES, MANIPULATE THEM, AND BUILD ANIMATIONS WITH

ANIMATOR'S TOOLBOX

- Shrink pictures in 50% steps and position them anywhere - all in REAL TIME!
- Make pictures tumble "head-over-heels"
- Shift a picture around on the screen
- Replace 1 color in a picture with a "background" picture
- Build compicated animations not limited to a few frames

32K DISK $24.95

AND DON'T FORGET THE ULTIMATE TREK ADVENTURE -- "STELLAR SEARCH" AVAILABLE IN TALKING (USING "REAL TALKER" FROM COLORWARE) OR NON-TALKING VERSIONS.

32K DISK	$26.95
TAPE	$24.95

VIEW 3-DIMENSIONAL OBJECTS FROM ANY ANGLE WITH

3D DESIGNER

- Convenient, on-screen menu
- Supports input from X-PAD, TOUCH-PAD, MOUSE or JOYSTICK
- Built-in screen dump to Tandy printers
- Calculates dimensions for you from just a rough sketch
- Plots or calculates lines and arcs
- On-screen sketching mode

64K DISK $29.95

CALL TOLL-FREE FOR ORDERS:
1-800-245-6228

IN PA OR FOR TECHNICAL QUESTIONS:
1-215-682-6855

BUY 2 PROGRAMS, GET 10 PERCENT DISCOUNT!

BUY ALL THREE, GET 15 PERCENT OFF!!

DRIVE 0 or 2 DRIVES

$269.

WITH RS DOS & 40 TRACK DRIVES

ADD $10. FOR JDOS & MANUAL or $10. FOR RS MANUAL

40 TRACK DRIVES NOW ARE NEW 1/2 HEIGHT DIRECT DRIVES

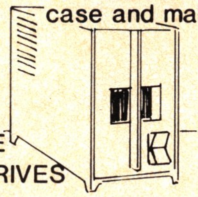
Complete disk drives from...

$159. INCLUDING CASE & POWER SUPPLY
40 Track $159. Double Sided $209.

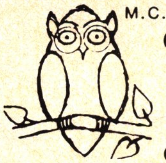
PANASONIC 1/2 HEIGHTS ADD $10. FOR TEAC DS
$229. with Owl Doubler 2 DRIVE $389.-$405.with Owl Doubler

NOW DOUBLE YOUR OWLS!!! $39.95

OWL DOUBLER is a device that allows use of both sides of double sided drive ! Software independent sits inside case and makes one disk drive 0&1 and the other 2&3!



All drives NEW.
40 track single sided drives may be manufacturers overstock.
6 month warranty on all drives.

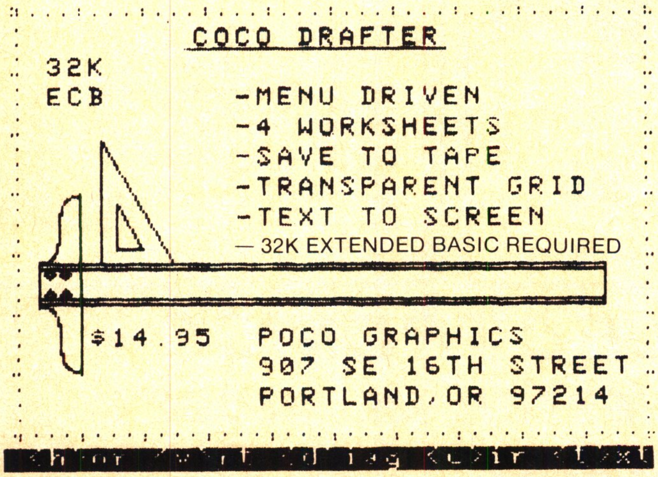


M.C. & VISA Accepted

OWL-WARE
P.O. Box 116-F
Mertztown, PA.
19539

PA Res Include 6% Tax
(215) 682-6855

```
MENU":PRINT:PRINT"  1. ADD RECOR
DS"
520 PRINT:PRINT"  2. SORT RECORD
S"
530 PRINT:PRINT"  3. SEARCH RECO
RDS"
540 PRINT:PRINT"  4. PRINT RECOR
DS"
550 PRINT:PRINT"  5. END PROGRAM
"
560 PRINT:PRINT" PLEASE ENTER YO
UR CHOICE (1-5)":K$=INKEY$
570 K$=INKEY$:K=VAL(K$):IF K<1 O
R K>5 THEN 570 ELSE SOUND 150,1
580 ON K GOTO 1000,2000,3000,400
0,10000
1000 CLS:GOSUB 5500:CLOSE #1:CR=
LR+1:PRINT"  YOU ARE ADDING RECO
RD #";CR:PRINT"  TO THE FILE ";F
$
1010 PRINT:PRINT"NAME (LAST NAME
, FIRST NAME)?":LINE INPUT R$(1)
1020 PRINT:PRINT"ADDRESS?":LINE
INPUT R$(2)
1030 PRINT:INPUT"CITY?    ";R$(3)
1040 PRINT:INPUT"STATE CODE?    "
;R$(4)
1050 PRINT:INPUT"ZIP CODE?    ";R
$(5)
1060 PRINT:INPUT"PHONE #?    ";R$
(6)
1070 GOSUB 5500:GOSUB 7100:GOSUB
 7200
1080 CLS:FOR X=1 TO 6
1090 PRINT:PRINTR$(X)
1100 NEXT X
1110 PRINT:GOSUB 7020
1120 IF K$="Y" THEN 1200
1130 CLOSE #1:CLS:PRINT:PRINT" F
IELD TO CHANGE?":GOSUB 6500
1140 CLS:PRINT:PRINT" OLD DATA I
S:":PRINTR$(CF):PRINT:PRINT" ENT
ER NEW DATA:":LINE INPUT R$(CF):
GOTO 1070
1200 PUT #1,CR:CLOSE #1:CLS
1210 PRINT:PRINT" WANT TO ADD MO
RE? (Y/N)":K$=INKEY$:GOSUB 7030
1220 IF K$="Y" THEN 1000 ELSE 50
0
2000 CLS:PRINT:PRINT" SORT ON WH
ICH FIELD?":GOSUB 6500
2010 CLS:PRINT:PRINT" SORTING...
":GOSUB 5500
2020 FOR X=1 TO LR:GET#1,X:GOSUB
 7200
2030 ST$(X)=R$(CF):ST(X)=X
2040 NEXT X
2050 FL=0:FOR X=1 TO LR-1
2060 IF ST$(X)>ST$(X+1) THEN GOS
UB 2500
2070 NEXT X:IF FL THEN 2050
2080 CLOSE#1
2100 F$=F$+"/DAT":T$=F$:TT$="TEM
P/DAT"
2110 GOSUB 5500:CLOSE #1
2120 FOR X=1 TO LR:GOSUB 5500:GE
T #1,ST(X):GOSUB 7200
2130 CLOSE #1:IF INSTR(1,R$(1),"
^") THEN 2200
2140 F$=TT$:GOSUB 5500:GOSUB 710
0:PUT #1,X:CLOSE #1:F$=T$
```


COCO DRAFTER

32K
ECB

- -MENU DRIVEN
- -4 WORKSHEETS
- -SAVE TO TAPE
- -TRANSPARENT GRID
- -TEXT TO SCREEN

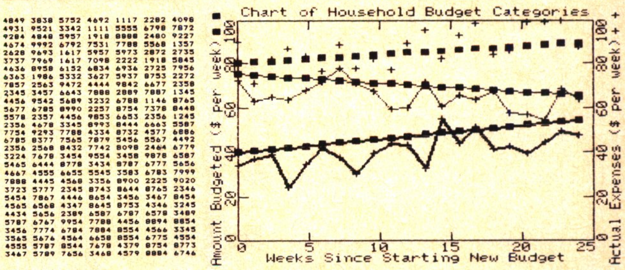
— 32K EXTENDED BASIC REQUIRED

$14.95

POCO GRAPHICS
907 SE 16TH STREET
PORTLAND, OR 97214

GRAFPLOT

TURNS THIS   INTO THIS



GRAFPLOT turns dull rows and columns of numbers into dazzling high resolution graphs in minutes. Perfect for business, personal, educational, scientific and engineering applications.

* NO RISK! MONEY-BACK GUARANTEE!
* FREE R/S SCREENPRINT PROGRAM!
* FULLY AUTOMATIC OPERATION!

"A great package gets even better ... totally impressed ... equally useful in the home and office ... meticulous, hand-holding documentation ... very easy to use" RAINBOW, 6/84 & 7/83
"A high quality product ... slick presentations" Hot CoCo, 8/84

- **Universal Screenprint Loader** for non-Radio Shack printers.
- Full ASCII upper and lower case in 4 on-screen labels.
- 9 graphing symbols with unlimited overlay of data.
- Full function data editing: add, change, delete and sort.
- Graphs and data output to screen, printer, tape or disk.
- Calculates user-defined functions, moving averages (binomial smoothing), cumulative totals and integrals (areas).
- Saves completed graphs for instant reloading.
- Works with all CoCo models - requires Extended BASIC.
- Disk Only: display or print directory, kill or rename files.

16K TAPE - $35.00, 32K TAPE - $40.00, 32K DISK - $45.00 (US)

ASK YOUR DEALER FOR GRAFPLOT OR ORDER DIRECT FROM:

HAWKES RESEARCH SERVICES, 1442 SIXTH ST., BERKELEY, CA, 94710

YOUR PERSONAL CHECK IS WELCOME!   SHIPMENT WITHIN 48 HOURS!
$3.00 SHIPPING ON ALL ORDERS.   CA. RESIDENTS ADD SALES TAX.

PARALLEL PRINTER INTERFACE

WORKS WITH ALL STANDARD PARALLEL PRINTERS

$59.95

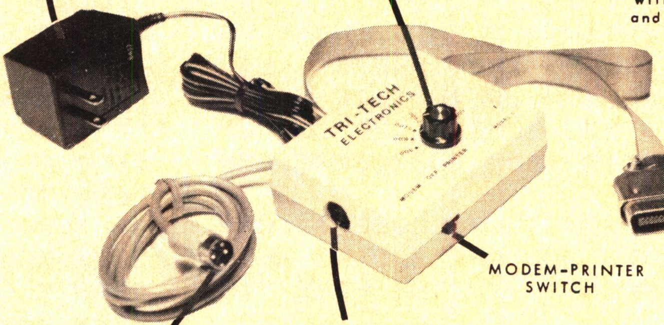
MODEL 1
(with modem connector and switch)

without power module---$ 54.95

$49.95

MODEL 2
(without modem connector and switch)

without power module---$ 44.95


POWER SUPPLY not needed with Gemini and C-itoh printers
SWITCH SELECTABLE BAUD RATES FROM 300 TO 9600
PRINTER CONNECTOR highest quality with metal shell and gold contacts
TRI-TECH ELECTRONICS
MODEM-PRINTER SWITCH
BUILT-IN MODEM CONNECTOR same pinout as Color Computer serial I/O port
COMPUTER CONNECTOR

ADD 3.00 FOR SHIPPING AND HANDLING

PRINTERS

* C-ITOH 8510AP PROWRITER 10" carriage	309
* C-ITOH 1550P PROWRITER 2 15" carriage	510
* C-ITOH 8510BPI switch selectable between IBM compatible or Prowriter compatible	389
* C-ITOH 8510SP new!! 180 cps.	435
* C-ITOH 8510SCP new!! 180 cps. color printer	499
* GEMINI 10X	259
* GEMINI 15X	399
* DELTA 10X	415

PLUS SHIPPING

SPECIAL SYSTEM PRICE !!

When a printer and the TRI-TECH interface are purchased at the same time you may deduct $10 from the system price.

SPECIAL OF THE MONTH

PRINTER/ INTERFACE SYSTEM

* STAR GEMINI 10X

120 c.p.s.
bit image graphics
5 different character sets
1-year warranty on parts and labor

* TRI-TECH PARALLEL INTERFACE MODEL 2

$299.95

* TRI-TECH PARALLEL INTERFACE MODEL 1

$309.95

EFFECTIVE THRU NOVEMBER 30, 1984

DISK DRIVES

COMPLETE DRIVE 0 SYSTEM INCLUDES:
J&M Disk Controller (JDOS or RSDOS)
Dual Drive Case & Power Supply
Dual Drive Cable and one of the following Disk Drives.

TEAC FD54A Disk Drive	$ 299.00
with 2 disk drives	$ 409.00
TEAC FD55A Disk Drive	$ 319.00
with 2 disk drives	$ 449.00
TEAC FD55B Disk Drive	$ 359.00
with 2 disk drives	$ 529.00
TEAC FD55F Disk Drive	$ 369.00
with 2 disk drives	$ 539.00

TEAC FD54A Bare drive single sided, half height, 40 track, 180K bytes	$ 119.00
TEAC FD55A Bare drive Teac's best single sided, 40 track, 180K bytes	$ 139.00
TEAC FD55B Bare drive Teac's best double sided, 40 track, 360K bytes	$ 169.00
TEAC FD55F Bare drive double sided, half height, 80 track, 720K bytes	$ 179.00
J&M Disk Controller (JDOS or RSDOS)	$ 129.00
Dual Drive Case & Power Supply	$ 59.00
Dual Drive Cable	$ 23.00

plus shipping

TRI-TECH ELECTRONICS

P.O. BOX 8100 ROCHESTER, MI. 48308
313 254-4242

```
2150 NEXT X
2200 KILL F$:RENAME "TEMP/DAT" T
O F$:GOTO 500
2500 FL=1:T$=ST$(X):ST$(X)=ST$(X
+1):ST$(X+1)=T$
2510 T=ST(X):ST(X)=ST(X+1):ST(X+
1)=T
2520 RETURN
3000 FL=0:CLS:PRINT:PRINT" DO YO
U WANT MATCHES SENT TO     THE P
RINTER AUTOMATICALLY?      (Y/N)
":K$=INKEY$:GOSUB 7030:KK$=K$
3010 PRINT:PRINT" IF YOU ARE SEN
DING OUTPUT TO     THE PRINTER, B
E SURE IT IS       READY AND ON L
INE.":PRINT:GOSUB 7000
3020 CLS:PRINT:PRINT"SEARCH ON W
HICH FIELD?":GOSUB 6500
3030 PRINT:PRINT"SEARCH FOR WHAT
?":LINE INPUT TG$:SOUND 150,1
3040 IF KK$="Y" THEN 3500
3100 CLS:GOSUB 5500
3110 FOR X=1 TO LR:GET #1,X:GOSU
B 7200
3120 IF INSTR(1,R$(CF),TG$)=0 TH
EN 3200 ELSE CLS:GOSUB 7200:GOSU
B 5400
3130 PRINT:PRINT" (P)RINT LABEL,
 (N)EXT ITEM,      (R)ETURN TO MA
IN MENU,           (D)ELETE, (C)H
ANGE)"
3140 PRINT:PRINT" INDICATE YOUR
CHOICE":K$=INKEY$
3150 K$=INKEY$:IF K$="" THEN 315
0 ELSE IF INSTR(1,"RPNDC",K$)=0
THEN 3150
3160 ON INSTR(1,"RPNDC",K$) GOTO
 3170,3190,3195,3180,3300
3170 SOUND150,1:CLOSE #1:GOTO 50
0
3180 SOUND 150,1:FOR Y=1 TO 6:R$
(Y)=STRING$(30,"^"):NEXT Y:GOSUB
 7100:PUT#1,X:GOTO 3200
3190 GOSUB 5000:GOTO 3120
3195 SOUND 150,1
3200 NEXT X: CLOSE #1
3210 IF FL=0 THEN PRINT" NO MATC
HES FOUND":GOSUB 7050
3220 GOTO 500
3300 SOUND 150,1:CLS:PRINT:FOR Y
=1 TO 6:PRINTLEFT$(STR$(Y),2);".
 ";R$(Y):NEXT Y:PRINT:PRINT" CHA
NGE WHICH FIELD? (1-6)":K$=INKEY
$
3310 K$=INKEY$:K=VAL(K$):IF K<1
OR K>6 THEN 3310 ELSE SOUND 150,
1:PRINT:PRINT" CHANGING FIELD #"
;K:PRINT:PRINT" INPUT NEW DATA:"
3320 LINE INPUT R$(K):SOUND 150,
1:GOSUB 7100:PUT #1,X:GOSUB 7200
:GOTO 3120
3500 CLS:PRINT:PRINT" SEARCHING.
..":GOSUB 5500
3510 FOR X=1 TO LR:GET #1,X:GOSU
B 7200
3520 IF INSTR(1,R$(CF),TG$) THEN
 GOSUB 7200:GOSUB 5000
3530 NEXT X:CLOSE #1
3540 IF FL=0 THEN PRINT" NO MATC
HES FOUND":GOSUB 7050
3550 GOTO 500
4000 CLS:PRINT:PRINT" PRINT ALL
RECORDS SECTION"
4010 PRINT:PRINT"  1. PRINT ON S
CREEN":PRINT"  2. PRINT ON PRINT
ER":PRINT"  3. PRINT ON LABELS":
PRINT"  4. PRINT PHONE # LIST":P
RINT"  5. RETURN TO MAIN MENU":P
RINT:PRINT"  PRESS A NUMBER (1-5
)":K$=INKEY$
4020 K$=INKEY$:PO=VAL(K$):IF PO<
1 OR PO>5 THEN 4020 ELSE SOUND 1
50,1
4030 ON PO GOTO 4100,4200,4100,4
300,500
4100 GOSUB 5500:CLS:IF PO=3 THEN
 PLAY "CDEF":PRINT" MAKE SURE PR
```

YORK 10®
DISKETTES

BRAND NAME QUALITY "DOUBLE DENSITY" AT DISCOUNT PRICES!

"Plain Wrap" $1.59* ea.

• Certified 100% Error-free •
5 YEAR WARRANTY

BASF qualimetric $2.19* ea. | Dysan $2.69* ea.

*5¼" SSDD, Soft sector, price per disk, 100 pak.

TRACTOR FEED DISKETTE LABELS 1 7/16 x 5" 2¢ EACH 1000 QUANT.

FLIP "N" FILE "15" for 5¼" Diskettes $7.95
"25," $21.95 "50," $31.95

Call: 818/700-0330
FOR IMMEDIATE DELIVERY
on Credit Card Orders.

ORDER NOW . . . MAIL TO –
YORK 10
9525 Vassar Ave. #R1
Chatsworth, CA 91311

ORDER FORM

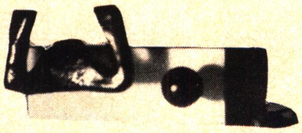
PLEASE INDICATE QUANTITIES DESIRED

SIZE	Plain Wrap	BASF	Dysan	TOTAL
5¼" SSDD	___ 10 17.90 ___ 100 159.00	___ 10 24.90 ___ 100 219.00	___ 10 29.90 ___ 100 269.00	
5¼" DSDD	___ 10 20.70 ___ 100 182.00	___ 10 33.90 ___ 100 298.00	___ 10 41.30 ___ 100 363.00	
5¼" DS96tpi		___ 10 47.90 ___ 100 421.00	___ 10 52.50 ___ 100 461.00	
8" SSDD		___ 10 30.90 ___ 100 274.00	___ 10 35.70 ___ 100 314.00	
8" DSDD		___ 10 38.60 ___ 100 339.00	___ 10 41.30 ___ 100 363.00	
DISKETTE LABELS, ☐ $3.00/100 ☐ $20.00/1,000				
FLIP N' FILE 5¼": "15," $7.95 qty. ___; "25," $21.95 qty ___; "50," $31.95 qty. ___				
			SUB TOTAL	
Calif. residents add sales tax				
Shipping/handling (any quantity)				3.50
Outside 48 Continental States; Additional $1 per 10 pak; per file				
			TOTAL	

All Diskettes are soft sectored, unformatted. #R1
In Continental U.S., shipments by U.P.S.
If Parcel Post preferred, check here ☐
Check or M.O. enclosed ☐ Send Quantity Discounts ☐
Charge to credit card: VISA ☐ MASTERCARD ☐
Card No. ________ Exp. ____
Name ________
Address ________
City ________ State/Zip ____
Signature ________ Phone ____

```
INTER AND LABELS     ARE SET UP A
ND ON LINE":GOSUB 7050
4110 FOR X=1 TO LR:GET #1,X:GOSU
B 7200
4120 IF PO=1 THEN GOSUB 5300 ELS
E GOSUB 5000
4130 NEXT X
4140 CLOSE #1:GOTO 4000
4200 GOSUB 5500:PLAY"CDEF":PRINT
" MAKE SURE PRINTER IS ON LINE":
GOSUB 7050
4210 FOR X=1 TO LR:GET #1,X:GOSU
B 7200
4220 PRINT#-2,R$(1);"   ";R$(2):P
RINT#-2,R$(3);"   ";R$(4);"   ";R$
(5);"   ";R$(6):PRINT#-2,""
4230 NEXT X
4240 CLOSE #1:GOTO 4000
4300 GOSUB 5500:PLAY"CDEF":PRINT
" MAKE SURE PRINTER IS ON LINE":
GOSUB 7050
4310 FOR X=1 TO LR:GET #1,X:GOSU
B 7200
4320 PRINT#-2,R$(1);"    ";R$(6)
4330 NEXT X
4340 CLOSE #1:GOTO 4000
5000 FL=1:IF LC=2 THEN GOSUB 510
0
```

FLY
THE COCO-150



$49.95

WHEEL AND THROTTLE FUNCTION LIKE A 'REAL' AIRPLANE - ADD REALISM TO YOUR FLIGHT SIMULATOR PROGRAMS !!!

SPECIAL COMBO OFFER
TOM MIX 'WORLDS OF FLIGHT'(WOF) + COCO-150
$72.95(T)/$75.95(D)

OR

ASI-IFR FLIGHT SIMULATOR - THE MOST VALID HOME COMPUTER INSTRUMENT FLIGHT SIMULATOR PROGRAM WE KNOW OF FOR PRACTICING IFR NAVIGATION AND APPROACHES USING CURRENT ACTUAL FAA MAPS AND APPROACH PLATES. PROGRAM ALLOWS QUICK AND EASY CUSTOMIZING TO YOUR LOCAL AREA AND UPDATES AS YOUR LOCAL FAA CHARTS CHANGE. PRICE INCLUDES COPIES OF OFFICIAL FAA FLORIDA SECTIONAL AND 5 ILS APPROACH PLATES. COCO-150 OR JOYSTICKS REQUIRED + 16K OR 32/64K (SPECIFY) EXTENDED BASIC ONLY

ASI-IFR $15.95 (TAPE ONLY)

ASI-IFR + COCO-150 $59.95

EVERYTHING PACKAGE - COCO-150 + WOF + ASI-IFR $82.95
ADD $3.50 POSTAGE AND HANDLING - FLA. RESIDENTS ADD 5% SALES TAX
SEND CHECK OR MONEY ORDER TO:

ALBAN SCIENTIFIC, INC.
P.O. BOX 15226
DAYTONA BEACH, FLORIDA 32014

CALL 904-252-5302

```
5010 FOR Y=LEN(R$(3)) TO 1 STEP
-1
5020 IF MID$(R$(3),Y,1)<>" " THE
N 5040
5030 NEXT Y
5040 R$(3)=LEFT$(R$(3),Y)
5050 PRINT#-2,R$(1):PRINT#-2,R$(
2):PRINT#-2,R$(3);",  ";R$(4);"
 ";R$(5)
5060 FOR Y=1 TO 3:PRINT#-2,"":NE
XT Y:RETURN
5100 P=INSTR(1,R$(1),","):IF P=0
 THEN RETURN
5110 N1$=RIGHT$(R$(1),30-(P+1)):
N2$=LEFT$(R$(1),P-1)
5120 FOR Y=LEN(N1$) TO 1 STEP -1
5130 IF MID$(N1$,Y,1)<>" " THEN
5150
5140 NEXT Y
5150 N1$=LEFT$(N1$,Y):R$(1)=N1$+
" "+N2$:RETURN
5300 CLS:PRINT:PRINT"  RECORD #"
;X:PRINT:FOR Y=1 TO 6:PRINTR$(Y)
:NEXT Y:PRINT:GOSUB 7000:RETURN
5400 FL=1:FOR Y=1 TO 6:PRINT R$(
Y):NEXT Y:PRINT:RETURN
5500 OPEN"D",#1,F$,99
5510 FIELD #1,30 AS N$,30 AS A$,
15 AS C$,2 AS S$,9 AS Z$,13 AS P
$
5520 LR=LOF(1):RETURN
6500 PRINT:PRINT" 1. NAME":PRINT
" 2. ADDRESS":PRINT" 3. CITY":PR
INT" 4. STATE":PRINT" 5. ZIP COD
E":PRINT" 6. PHONE #":PRINT
6510 PRINT" PRESS A NUMBER (1-6)
":K$=INKEY$
6520 K$=INKEY$:CF=VAL(K$):IF CF<
1 OR CF>6 THEN 6520 ELSE SOUND 1
50,1:RETURN
7000 K$=INKEY$:PRINT"   PRESS AN
Y KEY TO CONTINUE"
7010 IF INKEY$="" THEN 7010 ELSE
 SOUND 150,1:RETURN
7020 PRINT" IS THIS CORRECT? (Y/
N)":K$=INKEY$
7030 K$=INKEY$:IF K$<>"Y" AND K$
<>"N" THEN 7030 ELSE SOUND 150,1
:RETURN
7050 FOR X=1 TO 2000:NEXT X:RETU
RN
7100 LSET N$=R$(1):LSET A$=R$(2)
:LSET C$=R$(3):LSET S$=R$(4):LSE
T Z$=R$(5):LSET P$=R$(6):RETURN
7200 R$(1)=N$:R$(2)=A$:R$(3)=C$:
R$(4)=S$:R$(5)=Z$:R$(6)=P$:RETUR
N
10000 CLS:UNLOAD:END
11000 PCLEAR1:GOTO 20
```

Are Computers Producing Unrealistic Expectations?

By Michael Plog, Ph.D
Rainbow Contributing Editor

I recently saw an advertisement on television that bothered me a great deal. A concerned mother was discussing her child with a teacher. The child was not doing well at all in school. For the first half of the advertisement, I thought it might have been produced by the Mormons. (One of those extremely well done "get in touch with your child" spots.) Then, out of nowhere, the teacher suggests to the mother that a computer might help the child with her work. The next scene shows a young girl waiting at home. She is very unhappy, waiting for the results of the parent/teacher conference to determine her future. Mother comes in and says to the girl that they are going to buy a computer. A change comes over the girl; she smiles and hugs her mother, content that she will now be a success in school.

The ad bothered me a lot. It is true that the Pennsylvania state education department conducted a study and concluded that using computers in the classroom improves student learning and contributes to teacher efficiency. Also, a study from New York University found that a significant number of home computers were bought with a primary purpose of education. The interest in educational uses of computers is growing as the evidence of effectiveness mounts. What bothered me about the advertisement is the development of unrealistic expectations. A computer at home is not a guarantee of school success.

"The interest in educational uses of computers is growing as the evidence of effectiveness mounts."

Return for a moment to the study conducted by New York University. The principal researcher of this study was Joseph Giacquinta, professor of educational sociology. For three months, doctoral students observed 20 families in the New York area. They compiled about 2,000 pages of log reports. That is an impressive amount of information for a case study, and this study may be the first in-depth look at use and effects of microcomputers in the home.

The primary activity for the families using microcomputers for education was programming, or learning how to program. A "distant second" activity was word processing — school papers or class notes. Only a few families used educational software prepared by professionals to learn school subjects and skills.

The researchers of this study found that parents believed programming would make a person more logical or rational. Also, programming was being stressed in the schools their children attended.

Unfortunately, learning to program a computer does not make people more logical. It simple makes them better programmers. So far as I know, there is no evidence that programming skills transfer to other (i.e., logical) skills; any more than learning Latin makes a person more disciplined and logical. (Are you old enough to remember that assumption by educators?)

(Michael Plog received his Ph.D. degree from the University of Illinois. He has taught social studies in high school, worked in a central office of a school district, and currently is employed at the Illinois State Board of Education.)

If students are learning programming in their schools, then practicing on a home computer can do nothing but help their school work — but only that portion of their school work related to programming computers. Learning to program a computer will not improve a student's knowledge of history (or biology, or geography, or literature).

Please do not misunderstand me. I personally favor students learning computer programming. It is a skill that can be useful for many purposes throughout life. I know teachers who reduce their homework (yes, teachers have homework also) by putting student records on computers. Many service clubs and associations now have members who keep records on a microcomputer. Untold churches keep massive amounts of member information on a microcomputer. An uncountable number of professionals use their home computers for office work. And with all this, we have not even touched on the self-improvement possibilities of computer uses in hobbies and personal interests. But, learning to program a computer will not make a person a better reader — unless, of course, the programming results in software for reading.

Well, why are these parents in New York not buying more professionally prepared educational software? The researchers found the parents thought the materials were inadequate. Other factors were also noted by the researchers. Parents may not be aware of existing programs; they (parents) may lack the skill to evaluate programs; the cost of educational software may be too high; and parents may not know how the programs could be used by their children.

The preliminary findings from this study indicate that parents see the computer as an important educational tool for their children. The families, however, need additional help in understanding how the computer can be used for learning.

The parents in this study (as parents everywhere, probably) wanted to improve achievement at school and help their children compete against others at school, college, and at work. Parents feared, however, that their children would get "hooked on computers" and neglect other important interests.

Mr. Giacquinta and his graduate students will continue working with the families in the study, and hope to expand the research to a regional study, involving about 45 schools and hundreds of families. I hope they obtain the necessary funds for this research. The educational community needs the type of information uncovered by this research. We need the information to plan and develop computer curriculum, to understand what is happening when students interact with machines, and to help build the educational experiences that will be required in the next century.

Let's go back for a bit now, to the advertisement noted at the beginning of this article. The problem is unrealistic expectations. Computer salespeople hold up hardware and software as the cure for everything from stupidity to warts. When these claims are discounted by the general public, the danger is that real benefits of computers for education will also be discounted. We need to know what the computer will do, and what it will not do. The process of finding out what can and cannot be done by computers is education. Let's keep on getting educated.

COSMOS©
COMPUTER SERVICES, INC.

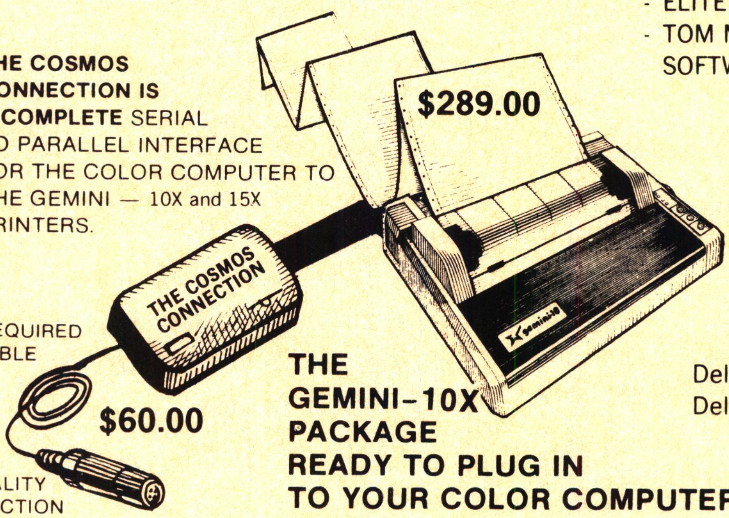
712 Chicago St.
Green Bay, WI 54301
(414) 432-4635

STOCK ITEMS SHIPPED SAME DAY!

THE COMPLETE TRS-80® LINE

- ELITE CALC $54.95
- ELITE WORD $54.95
- ELITE FILE $67.00
- TOM MIX SOFTWARE CALL FOR PRICE

THE COSMOS CONNECTION IS A COMPLETE SERIAL TO PARALLEL INTERFACE FOR THE COLOR COMPUTER TO THE GEMINI — 10X and 15X PRINTERS.



- NO AC REQUIRED
- SWITCHABLE BAUD RATE AT: 600
  1200
  2400
- HIGH QUALITY CONSTRUCTION
- COMPACT
- 90 DAY WARRANTY

$60.00

10X - $289.00
15X - $445.00
Delta 10 - $484.00
Delta 15 - $597.00

THE GEMINI-10X PACKAGE READY TO PLUG IN TO YOUR COLOR COMPUTER ONLY*

$325.00
GEMINI - 10X PACKAGE **

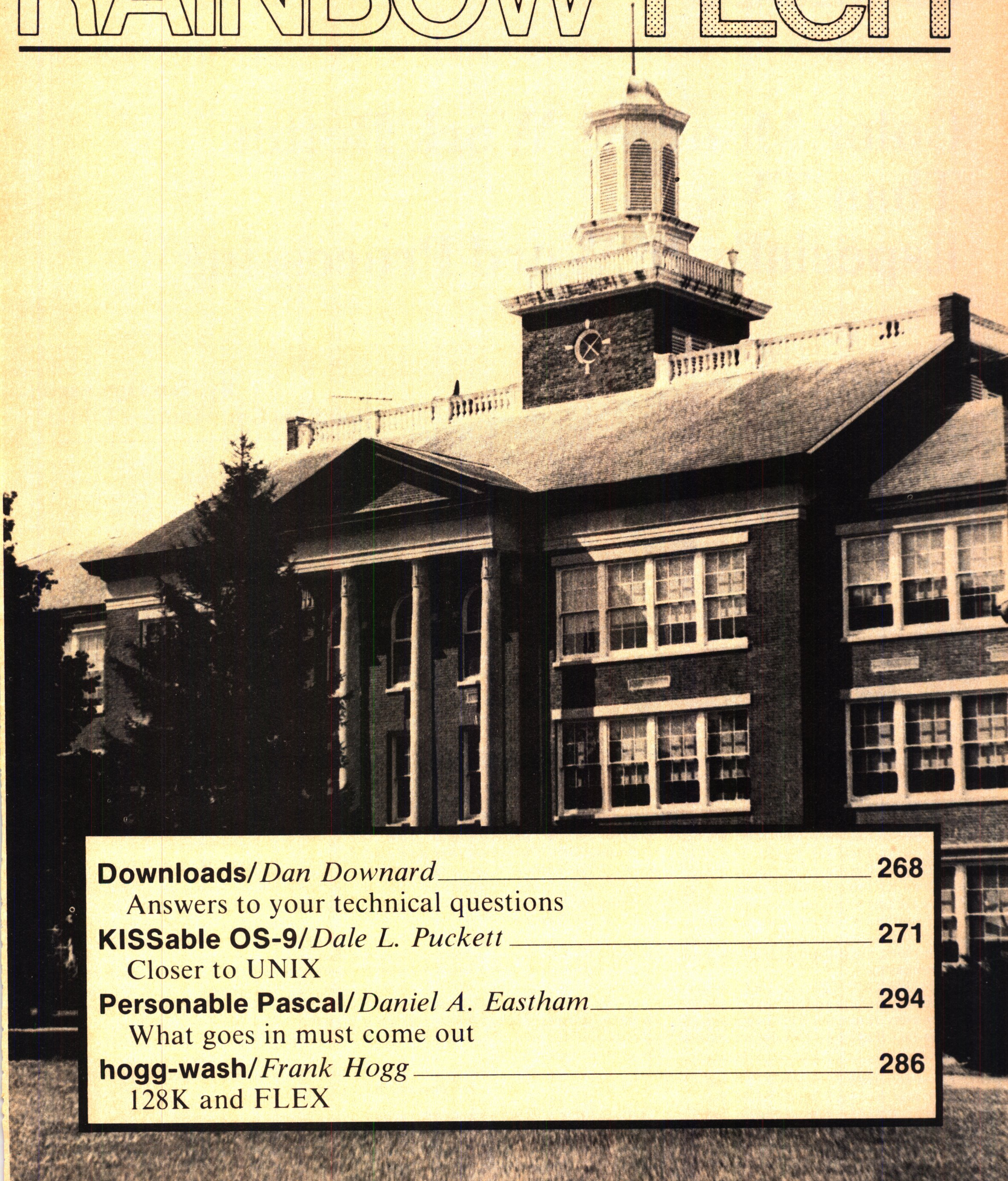
MasterCard
VISA

*Plus - U.S. ORDERS Add $10.00 Shipping & Handling
*Plus - CANADIAN ORDERS Add $25.00 for Shipping & Handling
**FREE - Shipping & Handling in U.S. with Package Orders
**Plus - CANADIAN ORDERS Add $15.00 for Shipping & Handling with Package Orders

star
micronics•inc
THE POWER BEHIND THE PRINTED WORD.

TRS-80 IS A TRADEMARK OF TANDY CORP. PRICES AND SPECIFICATIONS SUBJECT TO CHANGE.

RAINBOW TECH



Downloads/*Dan Downard* 268
Answers to your technical questions
KISSable OS-9/*Dale L. Puckett* 271
Closer to UNIX
Personable Pascal/*Daniel A. Eastham* 294
What goes in must come out
hogg-wash/*Frank Hogg* 286
128K and FLEX

RAINBOWTECH
DOWNLOADS

Color Monitors Work Better Than TVs, Especially In Word Processing

By Dan Downard
Rainbow Contributing Editor

• *I am interested in your comments concerning the use of color monitors with the CoCo. As you are aware, there have been quite a few advertisements for color monitors and video adaptors for the CoCo appearing in* THE RAINBOW. *After investigating these color monitors, I find that all of them appear to have low resolution. My question is whether or not you gain anything by using these color monitors with the CoCo instead of a good quality color TV, which you may have in your home at the present time. I read an article in a current magazine which stated that those color monitors were only good for graphics. Since I use my CoCo for word processing, I would appreciate your comments on the video display these monitors present when used with the CoCo.*

Joe H. Apple
Walkerville, MD

How come Joe Apple has a Color Computer? He has excellent taste, I guess.

Joe, the limiting factor on the use of a monitor is, in fact, the CoCo. The 6847 Video Display Generator was designed for use with an RF interface for driving a color TV. You are correct in your assumption that a "good quality TV" should work as well as a monitor. I am using a Sony 13" color TV for color graphics, but still use a 12" monitor for word processing.

The problem with TVs is that RF interference is always present and almost impossible to completely eliminate. This fact, coupled with the fact that most TVs do not have a sufficiently high bandwidth to display a 256 x 192 pixel dot matrix pattern, makes the use of a monitor very appealing for word processing.

I am convinced that the CoCo is comparable with any other computer in its price range as far as graphics capability, but you would never know it on a regular color TV.

IT'S ALL IN THE RESPONSE TIMES

• *I'm amazed by your knowledge of the inside operation of the CoCo! I have a good question for you and hope you can help me! In your October 1984 column, you told a fellow CoCo user how to dump ROM packs to tape, then to disk. I went to work, and dumped my* Color Baseball *ROM pack to disk. I couldn't believe it — it worked!*

Is it possible to play a Hi-Res game like Color Baseball *over the phone using a modem? I use my driver program from my* Colorama BBS. *The transmitting data LED on my Modem II lights up to indicate that something is being transmitted! On the receiving end, the other CoCo is running* Colorcom/E Version 2.4. *He only gets garbage characters from my CoCo. We've tried changing the* Colorcom *parameters, but the same thing happens. What would happen if we both ran the program called* RemoteRM *from the November 1983 issue? I feel it should be possible, but any advice you could offer us would be great. Thanks, and keep up the great technical work!*

Dale Westmoreland
Lannon, WI

I don't think it is practical to play action games over a modem, Dale. The problem is response time, not the transmission of graphics information. When using a modem you are limited to 300 Baud operation, and sending even one character requires a considerable amount of time. At the same time if the game program was resident in both computers, the key codes could be transmitted to allow both players control of the game.

Several different ideas come to mind. First of all, try purchasing a program called *Graphicom*. This program allows the transmission of Hi-Res screens over a modem. You will be able to transmit any graphics screens available on the CoCo.

Another thought would be to experiment with OS-9, or BASIC09. With BASIC09 the graphics module is controlled by an escape sequence from the programmer. It is initiated by the DISPLAY command. This makes BASIC09 ideally suited for the remote transmission of graphics information, since just a few characters are all that is necessary to control a graphics design. Good luck!

NOT THAT BAUD

• *My wife has given me an Apple Imagewriter serial printer to use with my 64K CoCo 2. I built an interface using diagrams of the two serial ports as found in the manuals. It works beautifully at 9600 Baud in* BASIC *(*POKE 150,1*). Using OS-9, though, when I set the Baud at 9600 (xmode /p Baud=6), the printer puts out only garbage. When I change the DIP switch settings to 2400 Baud and type "xmode /p Baud=4", it does just fine.*

Do you have any ideas as to why I can't get 9600 Baud in OS-9, when I can in BASIC*?*

Fred Sawtelle
Huntsville, TX

Unfortunately, Fred, OS-9 is designed for use with an ACIA chip for serial I/O rather than the PIA chip used in the CoCo.

(Dan Downard is an electrical engineer and has been involved in electronics for 24 years through ham radio [K4KWT]. His interest in computers began about five years ago and he has built several 68XX systems.)

ACIA stands for Asynchronous Communications Interface Adapter and is a device that receives parallel data from the internal CoCo data bus and converts the data to a serial output stream. The ACIA takes care of all the timing loops required to send the character. In the meantime the microprocessor can perform a myriad of other tasks required due to the multitasking nature of OS-9.

PIA is the notation for Peripheral Interface Adapter and is the parallel output equivalent of an ACIA. A PIA is designed for the input/output of parallel data, and therefore does not have all of the timing circuitry necessitated by serial data. To send a serial stream of information on a parallel device the microprocessor must provide the timing loops necessary. This is the reason that you are having problems.

Dale Puckett's column, "Kissable OS-9," contained a new interrupt driven driver for the serial port in the May 1984, RAINBOW. This driver could be modified for a solution to your problem, Fred, but 2400 Baud sounds pretty fast to me.

HOT CHIPS

• *I have a 64K ECB CoCo 1. I have been having a problem with my right joystick fire button for a long time. Please don't tell me to check the joystick — that was the first thing I checked.*

My problem is that the fire button will stop working after the computer has been on for an hour or more. Sometimes, but not often, it won't work on power-up.

Once it stops working, I can usually find a key on the keyboard which will act as the fire button until it 'cycles' back to life.

I have checked the contacts in the joystick plug as well as the computer's. In reading the technical manual and talking to people, I think it is either L1, L2, or the PIA chip, but I am no whiz at electronics. Any clues? I will be eternally in your debt if you can solve my problem.

David Johnston
Orlando, FL

On an "F" board CoCo, David, the fire button inputs are connected to U18, a 6822 PIA chip, in parallel with the keyboard. It sounds like you have a chip heating up and going bad. The right button is connected to Pin 2 of U18. I would replace U18 and see if this solves your problem.

INTERFACING TWO PROGRAMS

• *I need some advice about the possibility of having two machine language programs in memory simultaneously. First of all, is it possible? I have a 32K CoCo with Extended BASIC and a cassette drive. I have the* Musica *software from Speech Systems, and the* Voice Pak, *from Spectrum Projects. I would like to have the speech synthesizer announce each song to be played. This means having the text-to-speech software and the* Musica *file in memory at the same time.*

I would appreciate it if you could tell me if this is possible, and if so, how to do it.

Bergen H. Woods
Bensalem, PA

Your problem is not having the two programs in memory at the same time Bergen, but how to interface the two. You can have as many machine language programs in memory at the same time as memory permits, as long as the locations do not overlap. As I am not familiar with these particular programs, I will not attempt to give you the proper addresses.

Maybe a letter to Speech Systems can identify the addresses of the output routines. I'm sure you already have the addresses of the Voice Pak input routines. Just call the Voice Pak input routine with the output routine in the *Musica*. It may be a little complicated since you are dealing with strings instead of individual characters, but "Where there's a will, there's a way."

A LITTLE SCREEN DUMP

• *What are the most common commands on outputting a program from the screen to the printer and tape? I have a 64K Extended Color BASIC/TRS-80. I have been having problems sending printing messages from the screen to the printer. Please explain the procedures to use after the program is typewritten on the screen. I am a novice in operating the printer. Thanks very much for any information that you can give!*

Earl L.J. Foster
Lynchburg, VA

The most common method of outputting information to the printer, Earl, is by using the BASIC command *PRINT#-2*. In this context the *#-2* directs all output to the printer.

If you are into assembly language, the flag at $6F must be set with the value -1 and the output routine at $A000 must be called using indirect addressing.

As far as printing the contents of the screen, assuming you are using the normal 32 x 16 text mode, try the following screen dump program. Insert it into your BASIC program as a subroutine and call it using the command *GOSUB 10000* whenever you wish a screen dump.

```
10000 ZZ=0
10010 FOR XX=1024 TO 1535
10020 YY=PEEK(XX):ZZ=ZZ+1
10030 PP=YY AND 127
10040 IF PP>95 THEN PP=PP-64
10050 PRINT#-2,CHR$(PP);
10060 IFZZ=32THEN PRINT#-2:ZZ=0
10070 NEXT XX
10080 RETURN
```

NO SCROLL POKE

• *I would like to know the poke (if there is one) to enable you to put a* STRING$ *character at the last position on the screen without the screen scrolling. Whenever I did that, the screen would always scroll. If there isn't a poke, I would like to know a program that would let you continue with your own program. Help!*

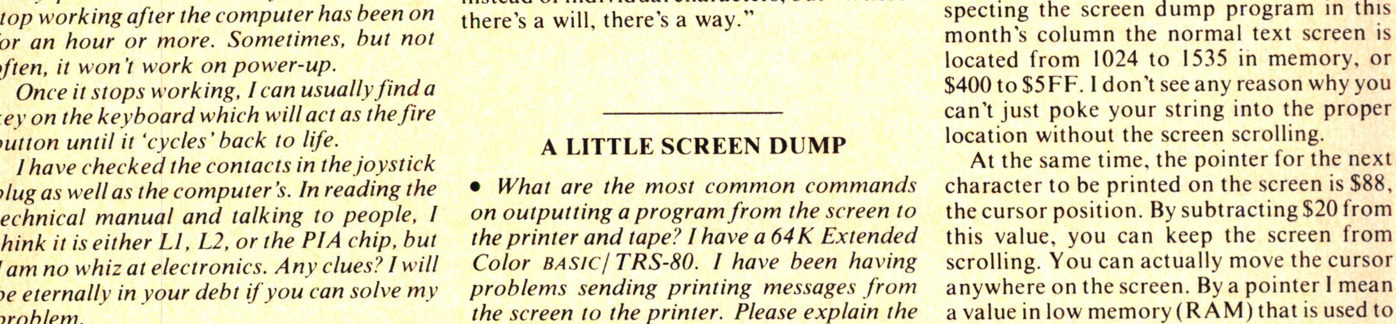
Mark Azar
Roanoke, VA

Mark, as you may have guessed by inspecting the screen dump program in this month's column the normal text screen is located from 1024 to 1535 in memory, or $400 to $5FF. I don't see any reason why you can't just poke your string into the proper location without the screen scrolling.

At the same time, the pointer for the next character to be printed on the screen is $88, the cursor position. By subtracting $20 from this value, you can keep the screen from scrolling. You can actually move the cursor anywhere on the screen. By a pointer I mean a value in low memory (RAM) that is used to keep track of what's happening.

Your technical questions are welcomed. Please address them to: Downloads, THE RAINBOW, P.O. Box 209, Prospect, KY 40059. We reserve the right to publish only questions of general interest and to edit for space and clarity.

CoCo Cat


I THINK I'LL OPEN UP A COUPLE OF THESE CHRISTMAS PRESENTS NOW... WHY WAIT 'TIL EVERYBODY WAKES UP?
OH-BOY!! A JOYSTICK! ...WHAT THE HECK IS A JOYSTICK?
McKIERNAN 12/84
ROLL... JUMP... MOVE...!! DO SOMETHING!
I DON'T KNOW WHY THEY CALL IT A JOYSTICK IT SURE DIDN'T BRING ME ANY JOY!
SMASH!

Saguaro Software

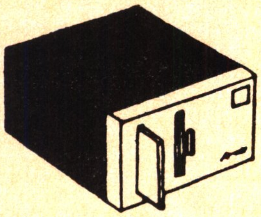
TOLL-FREE ORDER LINE

1-800-223-5369, Ext. 260

Monday - Friday, 9 AM - 5 PM MST

MasterCard VISA

Just In Time For Christmas!

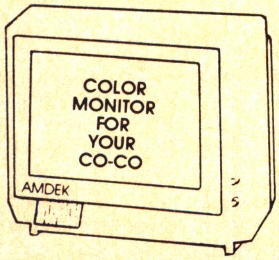


Amdek Dual 3" Disk Drive

Call For Absolute Lowest Price!

We'll Beat Any Advertised Price!

New!



Amdek Color Monitors

Good

Color 300

Better

Color 400

Best

Color 500

Call For Lowest Price!

GAMES

OTHXO

Othello machine language game for the 16K Co-Co. 2 modes of play - you against a friend or you against the computer. When playing the computer, it will play hard or easy. In either, you had better think hard! Object of the game is to change the opponent's spots to yours by placing your marker at the end of a row started by your marker. Not as easy as it sounds! Tape or disk, $24.95. Amdek, $29.95.

Co-Co Keno

Bring Las Vegas' Keno game home with Co-Co Keno. Bet $1, $3, or $5 & mark off 1 to 15 spots...can you beat the odds & win $50,000? 16K, high resolution screen. Keno chart print included. Tape - $24.95. Disk - 29.95. Amdek - $34.95.

EDUCATION

Kidstuf

Picture, Letter, or Number Association. Play an old-time tune with correct answer (7 songs), buzzes when wrong & waits for correct choice, 8 screens. Tape - $19.95. Disk - $24.95.

Stars Of America

Education should be fun - this program is just that! This tutorial uses 25 of the superstars of American history, from George Washington to Ronald Reagan.

The Civil War

A challenging two-person game. Questions cover Carpet baggers to the Battle of Vicksburg. Points are assigned according to the difficulty of the question, scores are displayed throughout the game.

Both Only:
Tape $19.95 Disk $24.95

History From 1863 To 1976

On two 16K non-extended tapes. For 1-4 people. Informative & fun way to learn important dates in world history. Written for students by a teacher. Tape - $19.95. Disk or Amdek - $24.95

ADVENTURES

Treasure Hunt

A graphics text adventure. You walk with our graphics character through desert, mountains and city to seek the illusive treasure of gold. Super graphics with a person who walks with you at each turn.
Disk - $29.95.

Do Or Die!

The year is 4001 A.D. You are a cargo trucker delivering a load in the Dorfian star system. Your mission is to get back to your home planet of Irat, alive. Can you survive the journey? Tape or disk - $24.95. Amdek - $29.95.

Loveless Manor

Trapped in a bedroom by your evil aunt, you've admired Queen Cinderella's castle in the distance...and you've just discovered she's a distant cousin. Can you escape to her protection? 32K. Great word adventure. Tape - $19.95. Disk - $24.95. Amdek - $29.95.

Raid On Boordanovka

Your mission, should you decide to accept it, is to steal Russia's newest weapon and save the world. Text adventure with 50 rooms. Tape - $24.95. Disk or Amdek - $29.95.

Search For The Llangth

After years of study & searching, you have at last traced the alien race of Llangth to this valley. Now your quest for the power of Llangth begins! Tape - $24.95. Disk or Amdek - $29.95.

MISCELLANEOUS

Co-Co Receivables	32K Disk	**29.95**
Ultimate Bingo & Jackpot	Tape	**19.95**
Confusion	Tape	**19.95**
Move-It!	Co-Co I	**15.95**

Gift Certificates Available!
In Any Amount

Discount Software From 20% - 25% Off!

Prickly Pear Software

Liz Pack	$145.00
Oracle II Tape	$ 26.75
Rom Free Tape	$ 18.75
Color Kit	$ 26.75
Disk Zapper	$ 26.75
Super Scroll	$ 18.75

Sugar Software

Radio System Design	$22.75
Tim's Utility	$11.75
Rainbow Screen Machine	$22.75
Super Screen Machine	$33.75

Tom Mix

Worlds of Flight	$23.75
Chambers	$19.75
Draconian	$21.75
SR-71	$22.75
Space Shuttle	$22.75

Computer House

Filmastr	$23.75

Petrocci Freelance Associates

Telepatch 64K	$11.75
Demon+ 64K (Edtasm, Graph Ed, Music Ed)	$26.75
Astro Cast 32K	$22.75
Adventure Game Decorder	$11.75

ADD $3.00 FOR DISK, $6.00 FOR AMDEK • CALL OR SEND FOR OUR CATALOG

7331 E. Beverly Drive • Tucson, AZ. 85710

Arizona Residents Add 7% Tax • Add $1.50 Shipping Per Program ($6 Max.)
Dealer Inquiries Welcome • Ask About Royalties • Quantities Limited

KISSable OS-9

Closer to UNIX

By Dale L. Puckett
Rainbow Contributing Editor

RAINBOWfest Princeton was outstanding. It was also exhausting. Yet, I have an intense enthusiasm for OS-9 and was happy to have the opportunity to talk about it for an hour and a half. It was standing room only; there must have been 300 people in the room. OS-9 is hot stuff.

In fact, OS-9 is so hot that RAINBOW hopes to increase its coverage soon. We especially need useful application programs that our readers can type in and run. If you've written one, please get in touch with Jim Reed. If you're application is long, he may be able to serialize it over several months. If you have short hints, tips or short utilities please send them to me and I will make every attempt to get them published here in "KISSable OS-9."

Speaking of utilities published here, congratulations to Tim Harris, a senior in the computer science programs at Iowa University in Ames. Tim has shared several programs with you in these pages (including two this month) and donated several C and assembly code listings for the Official RAINBOW OS-9 Guide.

Harris wrote us last week to thank us for publishing his work and to tell us that his listings in RAINBOW and in our new book helped him land a job at Microware in Des Moines. He said that because of the experience he gained writing utilities for RAINBOW and the OS-9 Users Group software exchange library, he would not have to start out writing C utilities like most beginning programmers. Thanks again for sharing your work Tim, and the best of luck in your new career at Microware.

Many of you have asked RAINBOW for more information about OS-9. Bruce Warner, president of the Northern Virginia Color Computer Club, will present the first of a series of tutorials in the January "beginners" issue.

Warner bought OS-9 at the local Radio Shack store here in Virginia shortly after it was released. Unfortunately, he became frustrated and put it back on the shelf. After I spoke to the club Sept. 1, I let him read our new book. Before the week was out, he started to understand OS-9 and now uses it almost exclusively. He hopes to share his "learning experiences" with you.

New Tools Abound At RAINBOWfest

We had our ears filled in Princeton. Third party software houses and innovative manufacturers are striving to keep the Color Computer the best bargain for your computing dollar. Because of efforts, the outlook for you couldn't be brighter.

We talked at length with creative people like Al Alberto at PBJ; John Kunze at RGS Micro Inc.; Brian Lantz at Computerware and FHL; and Joe Turner at Computer Systems Center to name just a few. They could barely contain their enthusiasm.

Let's start with PBJ. They brought 20 of their new *Word-Pak II* 80-column displays to RAINBOWfest but by the time I returned to their booth to buy one late Sunday, they had sold out. If you were impressed with *Word-Pak*, you'll love *Word-Pak II*.

PBJ's new cartridge brings you smooth scrolling, which means you can

---

(Dale L. Puckett is a free-lance writer and programmer who has worked with the Motorola family of microprocessors since 1976. He just completed his first book, The Official BASIC09 Tour Guide, *this summer. It has been published by Microware and made its debut at the Chicago* RAINBOWfest. *He is the author of* DynaSpell, Readtest, Esther *and* Help, *which are available from Frank Hogg Laboratories. He serves on the Info World Software Review Board and is a Chief Warrant Officer in the U.S. Coast Guard.)*

scroll the display off the screen one pixel at a time instead of an entire character line at a time. The character set has also been improved, and if you look closely you'll find a full 8 x 10 matrix that supports nice looking characters with full descenders.

The thing that really impressed me about this new board was the software switch that lets you display either *Word-Pak's* output or the video output from your Color Computer. You can now write a program that uses both 80-column text and graphics.

Cbreeze From PBJ — A Screen Editor For Programmers

And speaking of enthusiasm, Al couldn't wait to tell me about a new software tool. Al recognized the need for a short and fast screen-oriented editor for OS-9. He teamed up with Steve Bliss, and the result is *Cbreeze.*

I asked about that name and Al replied that it was a "breeze" to use and it was written in C, hence the name *Cbreeze.* We haven't had the time to test drive *Cbreeze* yet, but are looking forward to the experience. Despite the fact that this editor is only a little more than 11K bytes long, it appears to be quite comprehensive. All the standard cursor controls and screen movements commands are present, as is the ability to pass a command to the OS-9 shell.

> ***" . . . OS-9 is so hot that RAINBOW hopes to increase its coverage soon. We especially need useful application programs that our readers can type in and run."***

128K Cards Optimized For OS-9

John Knuze of RGS Micro Inc. was so excited Sunday you couldn't hold him down. He was showing off their 10 megabyte hard disk and describing the software he is writing for the 128K board. He is attempting to make the paging operation completely transparent to the OS-9 user. I look forward to seeing it.

After the exhibits closed Sunday, John gathered all the 128K board manufacturers together and sat them down to define a standard so that everyone's hardware would be compatible. It's great to see this kind of cooperation. Incidentally, John loaned me one of their hard disks with the OS-9 drivers, so we hope to give you a detailed report sometime in the near future.

Brian Lantz was excited, too. He flew to Princeton from Tampa so he could demonstrate some of his software at the FHL booth. Frank welcomed the help. He and his cousin Rich were busy with NOMAD, the new robot Frank hopes to sell for Christmas.

Lantz is the author of *OS-9 Textools* from Computerware and the *UniCharger* from FHL. *Textools* is one of the best utility packages for the Color Computer OS-9 user because it is written in assembly language. This makes the package short and fast. Many of the other packages are written in C and use quite a bit of your memory.

But the *UniCharger* is the real story. We listed the names of the utilities in this package several months ago. It's the package that makes OS-9 look a whole lot more like UNIX, bringing capabilities like AT and MAIL to OS-9. Lantz sent me a beta test copy several months ago and I exercised most of the new utilities.

I never did get around to installing a few of the more sophisticated system tools, however. To use them I would have had to modify my system password file. Between the new book, two RAINBOWfests, the Microware OS-9 Users Seminar and a major oil spill, I just couldn't work it in. Besides, it looked like it would be a hassle to do the job by hand. And, since I believe that my readers want software that is easy to install and run, I hassled Brian.

A pleasant surprise awaited me in Princeton. Lantz handed me a disk with the production version of the *UniCharger*. When I listed the directory, it contained files named *D0.Install* and *H0.Install.* They automatically copy all the commands to your CMDS directory, create a "profile" file, as well as MAIL and AT directories in your SYS directory, and convert your password file to the format needed by the *UniCharger* utilities. All you have to do is watch the computer do the work. That's the way software should be sold.

But, I soon learned that the *UniCharger* production disk was only a beginning. Lantz proceeded to tell about a new package he is preparing for FHL that will enhance your business. Programs in the set include *CALENDAR, LN, DELN, LPR, LPQ* and *LPRM.* If you look in a UNIX manual you'll see full descriptions of most of these new OS-9 tools.

Calendar lets you print any information about an activity you have scheduled for "today" or "tomorrow." It gets this information from a file named *Calendar,* which is stored in your SYS directory. On the surface this may not excite you. But, stop and think about the rest of the *UniCharger* package for a moment.

For example, you can use the AT command to run *Calendar* early in the morning. *Calendar* can run the MAIL command to put its information in your mailbox. When you come to work and sign on to your OS-9 terminal, you'll be reminded of that important meeting you scheduled two months ago.

LN works like the UNIX LN or ALIAS utilities. It gives you a way to use a filename in your current data directory to point to another file somewhere else. A file that has been linked to another by LN is like a synonym in the English language. The two filenames mean the same thing. *DELN* is a special version of the standard OS-9 *DEL* utility that you must use to delete a file that has been *LNed.*

LPR is an off-line printing utility that performs exactly like its UNIX namesake. This command enters the name of a file in the line printer queue and copies it into the *LPR* directory. If nothing is being printed from the queue, *LPR* proceeds to print it. *LPQ* reports the current state of the line printer queue and LPRM gives you a way to remove files that you own from the line printer queue. UNIX-like print spooling has arrived on OS-9.

About DynaCalc And OS-9

Finally, we can tell you a little bit about the hard work Joe Turner at Computer Systems Center has been doing for the Color Computer OS-9 owner. I say "finally" because we've known about some of these projects for more than six months. Unfortunately, we couldn't tell you about them because the news wasn't official.

Joe has been selling the popular *Dyna-*

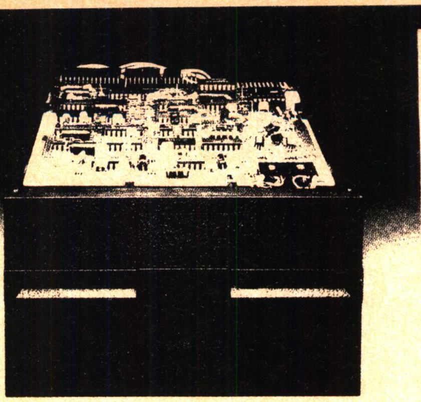
NEW DISK DRIVES

STARTING AT

$159.00

WITH CASE & POWER SUPPLY

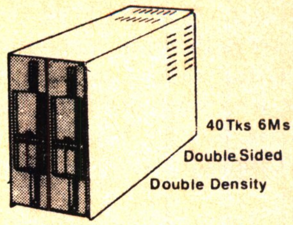
$189.95



TANDON MPI TEAC

Speed 6 ms tk to tk and up
Capacity 250k unformatted
Tracks 40
Warranty **now 1 YEAR**

New Low Price!



1/2 Hght. Teac/Panasonic

CALL FOR SALE PRICES

We carry only the finest quality disk drives * no seconds * no surplus

SATISFACTION GUARANTEED!! ALL DRIVES FULLY TESTED & WARRANTEED

Complete Disk Drive with Power Supply & Case	$189.95
Two Drives in Dual Case & Power Supply	~~$350.00~~ Call
1/2 ht double sided double density Disk Drives (Panasonic/Teac)	~~$219.95~~ Sale
1/2 ht double sided double density Disk Drive with ps & case......	~~$249.95~~ Sale

free How to use your new drive system on audio cassette

Single ps & case ...$44.95 ....Dual ps & case	$79.95
Color Computer Controller (J&M)	**$129.95**

DRIVE 0 FOR RADIO SHACK COLOR COMPUTER

TANDON, MPI OR TEAC DRIVE (SINGLE SIDED 40 TRACKS SPEED 5MS TRK TO TRK & UP)
POWER SUPPLY and CASE, TWO DRIVE CABLE WITH ALL GOLD CONNECTORS
J&M CONTROLLER, MANUAL and DOCUMENTATION .... ~~$329.95~~ ...... $ SALE!

BUY THE BEST FOR LESS! CALL!

DRIVE 0 FOR RADIO SHACK COLOR COMPUTER

PANASONIC 1/2 HEIGHT DOUBLE SIDED DOUBLE DENSITY DRIVE 500K unformatted
POWER SUPPLY and CASE, 2 DRIVE CABLE WITH ALL GOLD CONNECTORS
J&M CONTROLLER, MANUAL and DOCUMENTATION .... ~~$399.95~~ .... Super!! SALE!

TAKE ADDED SAVINGS ON TWO DRIVE SYSTEMS

DISKETTES with free library case	$17.95
Unadvertised Specials	$Call
Drives cleaned, aligned & tested	$29.95

TECHNICAL STAFF ON DUTY, PLEASE CALL FOR ASSISTANCE.

CALL US TODAY!! (617) 234-7047
ORDER TOLL FREE 1-800-635-0300

* DEALER INQUIRIES INVITED.
(617) 234-7047

TRUE DATA PRODUCTS

195 Linwood Street, P.O. Box 546
Linwood, Massachusetts 01525
(617) 234-7047

HOURS MON–SAT 9-6 (EST)

We welcome
- Visa/Master Charge
- Checks (allow 2 weeks for clearing)
- C.O.D. Add $2.00

Calc and *Dynamite+* programs to FLEX and OS-9 users with SS-50 buss systems for several years. Both of these programs are nothing short of outstanding. In fact, for about nine months now, people who own the PBJ 80-column card have bought *DynaCalc* for their Color Computer. It was a great combination.

Then, Radio Shack announced *DynaCalc* running under Disk Extended BASIC — complete with graphics. About the same time we learned from Joe that Radio Shack had licensed *DynaCalc* for OS-9 also. It's been released now, so we can steer you toward this powerful spreadsheet program.

> ***"If you're looking for an outstanding disassembler that can help you with OS-9, FLEX and Disk BASIC, check out the RAINBOW review in this issue. You can learn a lot about assembly language programming from disassemblers."***

DynaCalc was modeled after *VisiCalc* and runs most *VisiCalc* templates nicely. But, *DynaCalc* has been enhanced to the point that it is much faster and much easier to use than *VisiCalc*. If you're a manager and need a spreadsheet, give Joe Turner a call — or ask about *DynaCalc* at your local Radio Shack store.

While we're speaking of Joe, we should remind you about Dynamite+. If you're looking for an outstanding disassembler that can help you with OS-9, FLEX and Disk BASIC, check out the RAINBOW review in this issue. You can learn a lot about assembly language programming from disassemblers. In fact, the very first program I wrote in assembly language was a disassembler for the 6800 microprocessor. Without that project, I probably would never have learned how to program in assembly language.

User Group Library

In a recent column we announced the availability of OS-9 Users Group disks one through five, and described the items on disks one and two in detail . For those of you wondering about disk three and beyond, here's what you can expect. We're sharing this list because the users group is a good source for educational and useful programs. At $3 per disk of eight to 12 utilities, the price is right.

Word Processing Utilities

The programs on disk three have been chosen for their usefulness in word processing. Here is a list of all the files on this disk along with a short description.

tc is a program that does a line by line comparison of two text files and prints the lines that differ. It is written in Microware's C.

ppc paginates, dates, titles and lists C programs and text files to OS-9's standard output path. It is also written in Microware C.

split lets you compare two text files visually. It lists them side-by-side on your screen. You'll need a terminal or 80-column card for this one since it shows the first 38 characters of each line of both files at the same time.

untab expands the tab characters in a file to spaces. It assumes that the tab stops are every eight columns.

tab converts the spaces in a text file to a combination of tabs and spaces. It reduces the size of a file.

Sqsh is short for squash. It compresses all strings of spaces down to one space and replaces carriage returns with a slash, "/". Sqsh is written in 6809 assembly language.

TexCom is a BASIC09 program that compares two text files one line at a time.

Words.ASM splits a text file into individual words and prints them one to a line. It is written is 6809 assembly language.

Translit is a BASIC09 program that implements the transliteration algorithm described by Kirnighan and Plauger in the book *Software Tools*. It, in effect, translates a character or series of characters in a file into another character or series of characters.

Programming Utilities

Here is a description of the programming utilities contained on User Group disk number four.

ModBuild is a BASIC09 program that gives you a way to build a file containing more than one module from several single or multi-module files. It is a perfect tool for building a new *OS9Boot* file.

mv moves files from one directory to another by manipulating pointer references. No data is actually moved so it is an extremely fast way to transport large files from one directory to another.

latest scans a directory and all directories below it and prints the name of all files whose last modified date and time is later than the one you type on the command line.

module can be used to pass only selected modules from a file that contains many modules. It reads from standard input and writes to standard output, passing only the modules you name on the command line.

graft is similar to *dsave* except it actually copies the files in a directory instead of writing a shell procedure file to do the job. It uses a 32K buffer.

Pwd source code will show you how the print working directory command works.

BinCom is a BASIC09 program that does a byte for byte comparison of two specified files. It reports the differences and then offsets into a file.

DCopy is a BASIC09 program that copies the files in one OS-9 directory to another directory.

File Processing Utilities

The programs on disk five have been chosen for their utility as file processing aids. Here is a list of all the files on disk five:

stripz copies labels from a disassembly file to a separate file to help you create a substitution file with your editor. It is written in BASIC09.

equfix is a BASIC09 program that strips comments, blank lines, and pseudo opts from equate files.

pad improves the readability of your disassembly files by inserting blank lines after each statement that transfers control of the program. It is written in BASIC09.

sort is a general purpose sort. The file being sorted must fit in memory.

Hx prints each byte it reads from the standard input path in hexadecimal on the standard output path.

StripNum is a BASIC09 program that strips a specific number of characters from the beginning of each line in a text file. One use would be to strip the offset numbers out of a BASIC09 program listing.

StripREM strips all REM statements out of the specified input file. It is written in BASIC09.

FlexBin converts FLEX formatted binary files into full image binary files. It writes a new file in the OS-9 file format.

NewStrip strips all control characters except carriage returns out of the standard input path.

extract filters single C function definitions out of a C source file and sends them to the standard output path.

patch lets you change selected bytes in a data or directory file. It prompts for the address to change and then displays the value of the byte at the location you request.

intruder is similar to the standard OS-9 dump utility except that you can dump selected sectors from a disk. When called it displays the first sector of a file and then asks you which sector you want to see next.

Disks Six Through 13 Almost Ready

User Group disks six through 13 should be ready for distribution by the time this issue of RAINBOW hits the stands. Each of these disks has been designed to fill a specific need. Here's a listing of the tools on each of the 14 OS-9 Users Group disks:

Disk	Description
0	New Member Bonus Disk
1	Spelling Checker
2	Spelling dictionary (40-track, double-sided disk required)
3	Word Processing Utilities
4	Programming Utilities
5	File Processing Utilities
6	Source of Adventure program (40-track, double-sided disk required)
7	Executable object code of Adventure game
8	Additional games and demo programs
9	C-Programmers Tools
10	Math Utilities
11	Additional Word Processing Utilities
12	Additional Programming Utilities
13	Additional File Processing Utilities

We publish these listings of disks available through the OS-9 Users Group Software Exchange Committee because they provide a low cost educational vehicle for the beginner on a budget. If you are a member of the Users Group, you may order these disks by sending $3 and the name of the disk you want to buy to:

Software Exchange Committee
OS-9 Users Group
P. O. Box 7586
Des Moines, IA 50322

If you have a program to submit to the exchange library, you may send it along with a documentation file created by the *DocGen* utility on Users Group disk zero to the same address. If your program is accepted by the committee, you will receive one disk from the library free. The low price for these disks is made possible by the volunteer efforts of Carol and Jimmi at FHL. Say thank you the next time you call.

Installing Word-Pak II On Sdisk-Based Systems

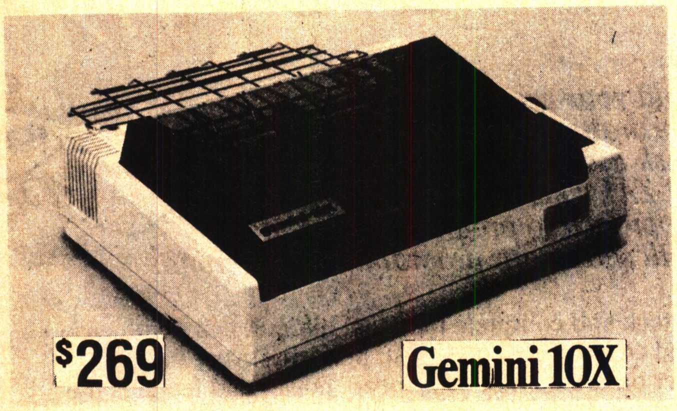
Beginners are usually nervous when they install new equipment on their Color Computer. PBJ *Word-Pak II* owners are no exception. At the Princeton RAINBOWfest, PBJ sold every *Word-Pak II* cartridge they brought to the show. And throughout the weekend, the less experienced, yet would-be hardware hackers, came to PBJ's booth and asked how to install *Word-Pak II.* Most of these people were using *SDISK,*

star™ PRINTERS

PRINTER CABLES AND INTERFACES AVAILABLE
Call for current pricing

- 100 - 120 - 160 CPS
- Bidirectional Logic Seeking
- Friction and Tractor
- 9X9 Dot Matrix
- True Decenders
- High Res-Bit Image Block Graphics
- Super Script-Subscript
- Underlining
- Backspacing Doublestrike
- 5, 6, 8 1/2, 10, 12 and 17 Pitch
- Programmable Line Spacing
- SIX (6) MONTH WARRANTY

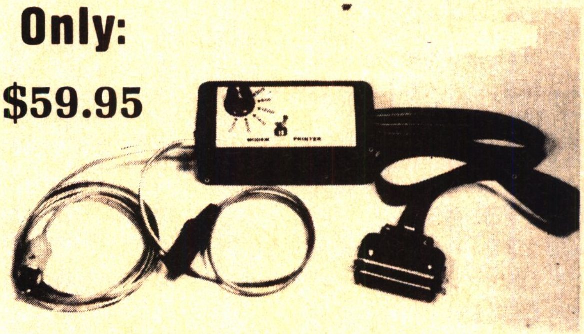
GEMINI 10X (9 Inch Carriage, 120cps) Friction and Tractor ..... $CALL
GEMINI 15 (15 Inch Carriage, 100cps) Friction and Tractor ..... $CALL
GEMINI 15X (15 Inch Carriage, 120cps) Friction and Tractor .... $CALL
DELTA 10 (10 Inch Carriage, 160cps) Friction and Tractor ...... $CALL



SP-3 INTERFACE for Color Computer

- 300-19,200 BAUD rates
- External to printer — No AC Plugs
- Built in modem/printer switch—no need for Y-cables or plugging/unplugging cables

Only:
$59.95



COMPLETE SYSTEM
ONLY 319^{95}
Nothing more to buy!

Dealer inquiries invited

TRUE DATA PRODUCTS
195 Linwood Street, P.O. Box 546
Linwood, Massachusetts 01525

CALL US TODAY!! (617)234-7047
ORDER TOLL FREE 1-800-635-0300

Help Us Battle the High Cost of Disk Drives

GRAMS
1983
BLE'S

NOW . . .
V-PRINT
A utility to print
directory on paper
$9.95

Un-DISK Drives $49.95?

You Bet! There are empty spaces in your 32K and 64K CoCo. The Preble VDOS Un-DISK helps you fill them up with PROGRAMS!

- Un-DISK uses your computer's extra memory like a fast disk drive.
- Un-DISK can store BASIC and MACHINE LANGUAGE programs.
- Un-DISK is INVISIBLE. Yup! Un-DISK does not interfere with normal Color Computer Operation.
- Un-DISK appears only when you type the magic word VDOS.
- Un-DISK comes with comprehensive instructions which you may not need because:
- Un-DISK is self-prompting and easy to use!
- Un-DISK is provided on cassette.
- Un-DISK is faster than a slow clumsy DISK DRIVE and best of all . . .
- Un-DISK is CHEAPER than a DISK DRIVE!
- Un-DISK will work even if you already own a disk but WHY BUY A DISK AT ALL?
- Un-DISK should be in the library of every serious CoCo user even if you own a disk says Frank J. Esser, independent reviewer for RAINBOW Magazine!

OK sure, disk drives ARE NICE. I own one. But if your finances are limited, the Un-DISK can give you much of the power of the mechanical drive. Even if you already own a disk the Un-DISK can work like a super fast extra disk.

EXTRA . . . EXTRA . . . EXTRA . . . EXTRA . . .
Additional Power For $14.95

Only with VDUMP for the Un-DISK!

- VDUMP lets you make a cassette backup copy of everything stored in the Un-DISK.
- VDUMP lets you save 5, 10, 15 or more programs on a single cassette tape file.
- VDUMP lets you switch Un-DISKs. With a single load operation replace a group of financial programs with a set of children's programs. (The new VDUMP tape overwrites the old.)
- VDUMP can allow you to save a whole lot of RAINBOW ON TAPE in a SINGLE file.
- VDUMP is the perfect companion to the Preble VDOS Un-DISK.

Available from Doctor Preble's Programs, naturally! Bringing you fine Color Computer Products Since 1983!

The Preble VDOS Un-DISK	$49.95
The Preble VDUMP	$14.95
Shipping & handling U.S. and Canada	$1.50
or $5.00 to other foreign points	

VISA and MasterCard accepted

DR. PREBLE'S
SINCE 1983
PROGRAMS

Order From:
Dr. Preble's Programs
6540 Outer Loop
Louisville, KY 40228
(502) 966-8281
Canadians may order from Kelly Software

or other *CCDISK* replacements with non-Tandy drives.

The solution is to change the installation procedure shipped by PBJ with their OS-9 *Word-Pak II* drivers. The package contains files named *INSTALL.1* and *INSTALL.2*. One works with single drive systems, the other with systems containing two disk drives. Here is the PBJ procedure:

```
t
tmode .1 -pause
chd /d1/MODULES
load save
save CCDisk CCDisk
save D0 D0
save D1 D1
save D2 D2
save D3 D3
save P P
save PRINTER PRINTER
save RS232 RS232
save T1 T1
save IOMan IOMan
save SCF SCF
save RBF RBF
save SysGo SysGo
save Clock Clock
save Shell Shell
save PipeMan PipeMan
save Piper Piper
save Pipe Pipe
OS9gen /d1 </d1/bootlist
unlink save
deldir /d1/MODULES
d
del /d1/bootlist
chd /d0
dsave -s30 /d0 >/d1/makecopy
chd /d1    tmode .1 pause
-t
```

This procedure file assumes you are using the standard Radio Shack *OS9Boot* file. And, it assumes that you are making your first modification to the Radio Shack OS-9 environment.

Let's determine what needs to be changed by looking at what would normally be in your *OS9Boot* file if you're using *SDISK:*

```
 Module Directory at 21:28:33
OS9          OS9p2      Init
Boot         SDisk      D0
D1           SD0        SD1
CCIO         P          PRINTER
TERM         IOMan      SCF
RBF          SysGo      Clock
Shell        RS232      T1
PipeMan      Piper      Pipe
```

You'll notice that some of the modules saved by the *Word-Pak II install.2* file are not in memory. Make these changes:

ORIGINAL LINE	NEW LINE
save CCDisk CCDisk	save SDisk SDisk
save D2 D2	save SD0 SD0
save D3 D3	save SD1 SD1
dsave -s30 /d0 >/d1/makecopy	dsave -s30 /d0 /d1 ! shell
chd /d1	(delete this line)
/d1/makecopy	(delete this line)
del /d1/makecopy	(delete this line)

The only other thing you need to do if you are using double-sided drives is to run D.P.Johnson's BOOTFIX on drive /d1 immediately after you use the OS9Gen command. Just insert the following line in the procedure file after the line that contains the OS9Gen command:

```
BOOTFIX /d0
```

> ***"You need a quick count of every file on the entire disk, but you are afraid if it would take days to trace all the directories. No problem, it's time to let* DCHECK *go to work."***

An alternate method is to install *Word-Pak II* as directed using a standard copy of Tandy's OS-9 and the original *Word-Pak II* installation procedure. After you have done this, you can install the additional disk descriptors and the new disk driver. In either case, once *Word-Pak II* is installed, you will be delighted with the results.

DCHECK

Sometimes you will find that you cannot read a file. Yet, everything appears to be okay. You've checked to see if the file is a directory file, it isn't. You've checked to see if it is an executable file, it isn't. What next?

One thing you can do is check the file structure of your disk. If your only experience up to now has been with Color Computer Disk Extended BASIC, you're in for a treat. OS-9 gives you a command that you can only wish you had with Disk BASIC! Enter *DCHECK.*

DCHECK lets you verify the file structure of any disk mounted in any drive on your system. Don't be confused by the $0005A0 sector count. That's 1440 in decimal. I use 40-track, double-sided, double-density drives.

If you are using a system with two drives try entering *DCHECK /d1.* You should see a listing similar to this:

```
Volume - 'Rainbow-Articles' on device
   /d1
$00B4 bytes in allocation map
1 sector per cluster
$0005A0 total sectors on media
Sector $000002 is start of root directory FD
$000A sectors used for id, allocation
   map and root directory
Building allocation map work file...
Checking allocation map file...

'RainbowArticles' file structure is
   intact
4 directories
7 files
```

Perhaps you've just developed a serious software package designed to count the number of hairs on a balding head. The disk containing your program and its necessary modules and data files includes a number of files that are stored in several sub-directories. Since your program is dedicated to counting, you want to tell potential customers exactly how many files and directories are on the disk.

You need a quick count of every file on the entire disk, but you are afraid if it would take days to trace all the directories. No problem, it's time to let *DCHECK* go to work. *DCHECK* has an option that can give you the exact information you need.

If your disk has as many sub-directories as the Tandy OS-9 System Disk, you will find an unknown number of files stored in an unknown number of directories. Use the *DCHECK* command with the "-s" option and you should see something like this:

```
4 directories
59 files
```

You may also want to use the "-b" and "-p" *DCHECK* options. "-b" lets you check the structure of a disk without listing the unused clusters. "-p" prints the complete pathlist to each cluster that may have a problem.

You should note that *DCHECK* cannot process a diskette with directories more than 39 levels deep. Who cares?

How many times are you going to wind up at level 39 with single-sided, 35-track drives? If you ever find yourself that far out on a limb, you've probably over-organized your directories.

Two Tips Born Of Necessitiy

One night this week, following a long, hard evening filled with "writer's block" and a general lack of creativity, I saved my efforts and went to bed. The next evening I tried to run a word count — the wc utility — and came back with zero words. Then, I tried to list my article and OS-9 returned a CRC Error. I tried to copy it to another file and got the same result. I kept trying. Nothing worked.

I didn't have the energy to rewrite 3,000 words. Further, I didn't have time. I had to find a way to recover my work. I used a disk edit utility I own and attempted to dump the sectors in the bad file. It turned out that the first sector of the file contained garbage. OS-9 refused to read it. Since everything else in the file seemed to be all right, the answer was to skip the first sector. The BASIC09 procedure below will do the job for you.

```
PROCEDURE recover
(* A way to skip a bad sector *)

DIM char,path,newpath:BYTE

OPEN #path,"KISS.temp":READ
CREATE #newpath,"KISS.recovered"
:WRITE

SEEK #path,257

WHILE NOT(EOF(#path)) DO
  GET #path,char
  PUT #newpath,char
  PUT #1,char ENDWHILE

END
```

You could also use the procedure above if the bad sector in your file was located in the middle of the file. To do this, you could list the file to another file. It should work up to the point where you hit the bad sector. At this point you can count the number of bytes you have recovered, add 256 to it and change the SEEK statement in the procedure recover to get you past the bad sector. Then, merge the two files together and rewrite the copy that was held by the bad sector. Rewriting 256 characters is a whole lot better than rewriting 3,000 words. Good luck.

A DynaStar Tip

Since I got behind while writing the new book and attending the RAINBOWfest, I did some of this column on my Radio Shack Model 100 while riding in the carpool.

However, when I uploaded the file from the Model 100 I found that it left the TAB character, 9 decimal, in the file. At other times, I've needed to remove line feeds. For example, I often duplicate the output of a *DIR* command in the column. The *DIR* command sends out a line feed, 10 decimal or $0A hexadecimal, after the header.

These extra characters drive *DynaStar's* cursor control bonkers. In fact, they may do the same to your screen editor. The solution is to use a TR or transliterate utility. One is available from the Users Group Software Committee, another is in the OS-9 File Handlers Toolbox from Microware. Here's the command line I used.

"With OS-9, you almost don't need to create it. The capability is built in."

```
OS9: list KISS.temp ! tr \9 ! tr \10
>KISS.December
```

Emulating A Typewriter

On my desk at work, I use a Wang PC. I didn't buy it. Frankly, I would rather use *DynaStar* or *Stylo* than the archaic, memory hungry, menu-driven monster word processing software in the PC. However, it has one function I like a lot — it can emulate a typewriter.

Needless to say, you must get through two or three menus before you can use it, but, it really comes in handy for short notes and memos when you don't want to bother to go through three menus to create a new word processing document. I decided I would create this function for my GIMIX and Color Computers.

With OS-9, you almost don't need to create it. The capability is built in. However, I want to take you through an experiment that will help you understand a few of the OS-9 commands and a BASIC09 procedure that shows how you can use more than one technique to do a job.

First, let's try to build a typewriter emulation with the copy command. It should work, shouldn't it? Try the command line below. Type the ESCAPE character CLEAR BREAK on Color Computer OS-9 when you get ready to quit.

```
OS9: copy /term /p
```

What happened? I'll bet it worked great on the first line you typed. You were probably even wearing a broad smile until you typed the second line. It was printed right on top of the first line, wasn't it?

This happens because the copy command does not use the built-in OS-9 line editing functions. It uses character input/output rather than line input and output. As any hacker will tell you, it uses the I$Read and I$Write system calls rather than the I$ReadLn and I$WritLn calls.

Let's try again. Type:

```
OS9: list /term >/p
```

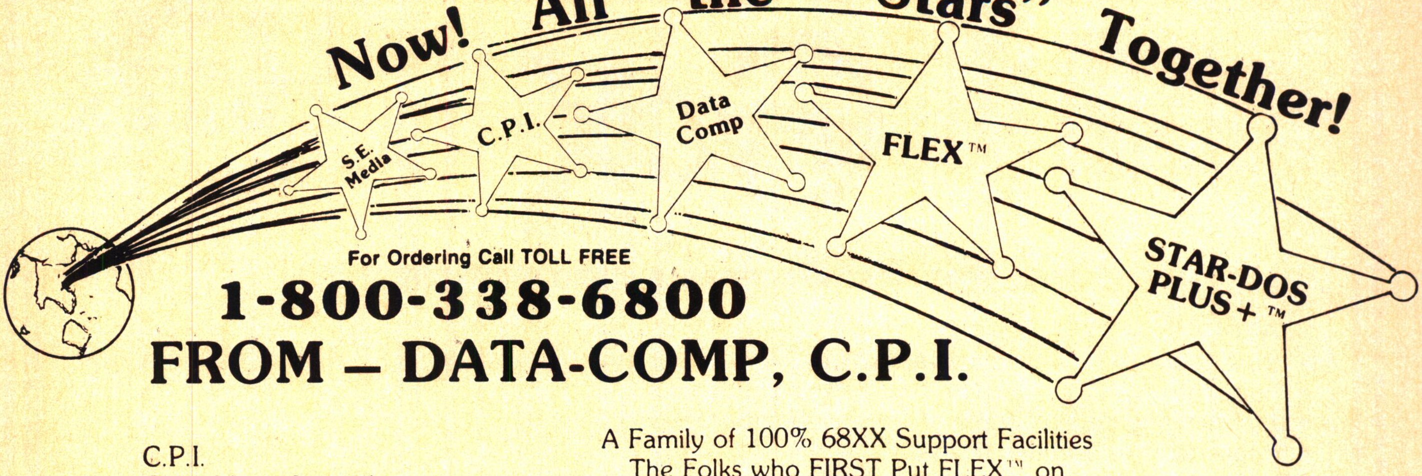
It worked, didn't it? Congratulations, you now own an extra typewriter — and one that will let you edit or correct each line before you print it. Experiment a little and you will find that the CLEAR A, CLEAR X and other OS-9 special line edit keys all work while you are using this command line.

I was disappointed. I wanted to write a BASIC09 program to do the job. In fact, I wrote it anyway. It will show you how certain high level language functions relate to functions at the Operating System level.

```
PROCEDURE tw

(* Emulate a typewriter *)

DIM printer:INTEGER
DIM in:STRING[80]

OPEN #printer,"/p":WRITE

LOOP
  ON ERROR GOTO 10
  INPUT "Enter: ",in
  WRITE #printer,in
ENDLOOP

10 CLOSE #printer
END
```

When you test "tw" you'll see that it works just like the OS-9 command line that used the *LIST* command. But since

Now! All the "Stars" Together!



For Ordering Call TOLL FREE

1-800-338-6800

FROM – DATA-COMP, C.P.I.

C.P.I.
Color Micro Journal
'68' Micro Journal
Data-Comp
S.E. Media

A Family of 100% 68XX Support Facilities
The Folks who FIRST Put FLEX™ on
The CoCo
Now Offering: *FLEX™ (2 Versions)
AND *STAR-DOS PLUS+ ™

FLEX-CoCo Sr.
with TSC Editor
TSC Assembler
Complete with Manuals
Reg. $250.(*)
Only $79.95

STAR-DOS PLUS+

- Functions Same as FLEX
- Reads - writes FLEX Disks
- Run FLEX Programs
- Just type: Run "STAR-DOS"
- Over 300 utilities & programs to choose from.

$34.50

FLEX-CoCo Jr.
without TSC
Editor & Assembler
$49.95

PLUS

ALL VERSIONS OF FLEX & STAR-DOS• INCLUDE

+ Read-Write-Dir RS Disk
+ Run RS Basic from Both
+ More Free Utlities
+ Super 800 Support
+ Free Color Micro Journal 1 yr. sub.
+ External Terminal Program
+ Test Disk Program
+ Disk Examine & Repair Program
+ Memory Examine Program
+ Many Many More!!!

TSC Editor
Reg $50.00
NOW $35.00

TSC Assembler
Reg $50.00
NOW $35.00

DISK SYSTEMS FOR THE COLOR COMPUTER

THESE PACKAGES INCLUDE DRIVE, *CONTROLLER, POWER SUPPLY & CABINET, CABLE, AND MANUAL.

* SPECIFY WHAT CONTROLLER YOU WANT **J&M**, OR **RADIO SHACK**.

PAK #1 - 1 SINGLE SIDED, DOUBLE DENSITY SYS.	$389.95
PAK #2 - 2 SINGLE SIDED, DOUBLE DENSITY SYS.	$639.95
PAK #3 - 1 DOUBLE SIDED, DOUBLE DENSITY SYS.	$439.95
PAK #4 - 2 DOUBLE SIDED, DOUBLE DENSITY SYS.	$699.95
PAK #5 - 2 DOUBLE SIDED, DOUBLE DENSITY SYS. THINLINE DRIVES, HALF SIZE	$659.95
COLOR COMPUTER II 64K W/EXT. BASIC	$189.95

CONTROLLERS

J&M DISK CONTROLLER W/ JDOS OR RADIO SHACK DISK BASIC, SPECIFY WHAT DISK BASIC.	$139.95
RADIO SHACK DISK CONTROLLER 1.1	$134.95

DISK DRIVE CABLES

CABLE FOR ONE DRIVE	$ 19.95
CABLE FOR TWO DRIVES	$ 24.95

MISC

64K UPGRADE W/MOD. INSTRUCTIONS, C,D,E,F, AND COCO 2	$ 49.95
HJL KEYBOARDS	$ 69.95
MICRO TECH LOWER CASE ROM ADAPTER	$ 74.95
RADIO SHACK BASIC 1.2	$ 29.95
RADIO SHACK DISK BASIC 1.1	$ 29.95
RADIO SHACK EXT. BASIC	$ 39.95
SCREEN CLEAN CLEARS UP VIDEO DISTORTION	$ 39.95
MEMOREX DISKS 5" SS,DD	$ 24.00
SHIPPING INCLUDED ON DISK PRICES	
DISK DRIVE CABINET & POWER SUPPLY	$ 49.95
SINGLE SIDED, DOUBLE DENSITY 5" DISK DRIVE	$199.95
DOUBLE SIDED, DOUBLE DENSITY 5" DISK DRIVE	$249.95

PRINTERS

EPSON RX-80	$325.00
EPSON RX-80FT	$375.00
EPSON MX-100	$650.00
EPSON FX-100	$799.00
EPSON FX-80	$549.00
EPSON MX-70	$200.00

SERIAL BOARDS FOR PRINTERS

MX-SERIES	$119.95
FX-SERIES	$ 99.95

USA ADD 2% SHIPPING
FOREIGN ADD 5% SHIPPING

5900 Cassandra Smith Rd. Hixson, TN 37343
TEL. (615) 842-4600 • TELEX 558 414 PVT BTH

*FLEX is a Trademark of Technical System Consultants
*STAR-DOS+ is a Trademark of STAR-Kits & Data-Comp

YOU SAW IT AT RAINBOWFEST PRINCETON . . .

GRAFX

VIDX

VIDEO DIGITIZER

by John Yurek

THE FIRST AFFORDABLE VIDEO DIGITIZER

FEATURES:
- Easy hook-up to your camera, VCR or TV
- Plugs into RS-232 port (No Y-cables or Multipacks!)
- Digitizes any subject (Live or from video source)
- Single scan or additive scans
- Single or multiple exposures
- Reads or writes binary or graphicom files
- Superb text quality

(Requires 32k and disk drive)

VIDX VIDEO DIGITIZER with all software .... only **$99.95 (+ $3.00 postage)**

with Digitizer, printer and modem switch .... only **$124.95 (+ $3.00 postage)**

GRAFX

MONTHLY GRAPHICS DISK

Look no further for the finest monthly graphics disk for the COCO. Insert GRAFX into your drive and view fine works of art with MUSX!! Each month you receive a mixture of humorous, seasonal and technical disigns . . .

One year subscription **$99.95**

Three month trial only **$30** (We'll credit your **$30** to a full year's subscription)

Sample Disk — **$13.95***

SHRINX

by John Yurek

SHRINX is a special utility for shrinking or enlarging your graphics pictures!

FEATURES:
- 1 to 4 drives
- Enlarge or shrink (quad frame)
- Variable shrink (1 - 100%)
- Get or transfer to a GC Disk
- Load or write a Binary Pix File
- Directory of any drive
- User friendly menu

REQUIRES 32k, 1 drive

only **$29.95***

GRAPHICOM

The best graphics and animation utility for the COCO. Draw with joysticks or koala pad. Artifact colors and rubber band graphics.

REQUIRES 64k, 1 Drive and and joysticks.

only **$24.95** ★

Special on GC Disks

ART DISK #1
ART DISK #2
AID DISK #1
FONT DISK #1

Regular **$19.95** each
all 4 disks **$29.95***

MUSX

The new sound of music for the COCO. Plays 4 sounds at one time! Sounds Terrific! Easy instructions to interface with your stereo amp for true fidelity. Each disk contains 10 songs.

MUSX DISK #1 (pop)
MUSX DISK #2 (pop)
MUSX DISK #3 (pop/class.)
MUSX DISK #4 (classical)
MUSX DISK #5 (EZ Listening)
MUSX DISK #6 (pop Christmas)

each disk **$13.95***
all six for **$50.00***

HAM SOFTWARE

by John Yurek (K3PGP)

Used world wide by Hams since 1979.

CW - Turns your TRS-80 4k machine into a CW keyboard and CW receive terminal. COCO version has real time printer.

MODEL 1 or 3 , COCO
$44.95* (Tape)

RY - Turns your TRS-80 4k machine into a 5 level (Baudot Code) Teletype Machine).

MODEL 1 or 3, COCO
$49.95* (Tape)

To place your order send check or money order to:

GRAFX

P.O. Box 254
West Mifflin, PA 15122
VOICE LINE (412) 466-6974
(6 - 9 PM)

24 HR BBS - COCONET
(412) 744-2335
300 - 1200 Baud Modem Online

***add $2.00 for postage & handling**

GRAPHICOM - TM of Cheshire Cat Computer Creations

TRS -80 COLOR COMPUTER - TM of Tandy Corp.

you now have it in a high level language you could add some fancy features of your own. If I get a chance, we may pursue this further in the future. In fact, if you add some bells and whistles I hope you will share it with other "KISS-able OS-9" readers. Here's a hint from *The Official BASIC09 Tour Guide.* Study the procedure CONVERT on Page 75. Have fun!

D UTILITY — DIRECTORY

The "d" utility is a new directory command similar to "ls" in UNIX, which prints files in the current data directory to standard output. The files are listed one per line instead of several per line as in the usual dir command in OS-9. This feature allows the output of d to be used by other utilities, like dl and wc. d also includes a wild card option so you can output only files with certain characteristic patterns.

The d command has two options only, -? and -w. The -? will output a help message and the -w will turn on the wild card matching for the command. There are two wildcard characters that can be used, ? and *.

The question mark is a single character wildcard while the asterisk is a multiple character wildcard. For example, a?c matches "abc", "adc", "aec", etc... You can use the ? wildcard also to match only files of a given length, for example, ???? matches names with four characters, ??? matches names with three characters only, etc.

The asterisk wildcard can be used in three ways basically, in the front as in *.c it matches any names ending in ".c"; in the back as in ab* it matches any names beginning in "ab" and in the middle as in *a* it matches any names with an "a" in the middle.

Some sample calls with just the d command are:

d	lists all the current directory
d -w *.c	lists files ending in ".c"
d -w c*	lists files beginning with "c"
d -w a?c	lists files "abc","adc",....
d -w ???	lists files with three char names
d -?	prints help message

The d utility can also be used with other utilities, especially, dl. With dl you can pipe the d output to delete a list of files, using the -z option of dl. In this way you can delete all files in a directory with one line or delete all files matching a given pattern with a one line command.

Example calls with dl are:

d ! dl -z	deletes all files in current directory
d -w *.c ! dl -z	deletes all files ending in ".c"
d -w ?? ! dl -z	deletes all files with 2 char names

You could also use d with other utilities in the package to get other results. For example, piping the output into wc will give the count of files in the directory:

d ! wc -l	prints count of files in directory
d -w *.c ! wc -l	prints count of all ".c" files

DL UTILITY - DELETE

The dl utility is a delete utility similar to the delete command found in OS-9/68K. It can work just like the standard OS-9/6809 command or it can be used as discussed in the previous section with the d utility.

dl contains only two options also; -? to generate a help message and -z to allow a list of pathnames to be used from the standard input, thus making the facility for piping into dl via d.

To use like the standard command you use a command like:

dl file1 [file2] ... [filen]

You can delete as many files as you can fit in a command line.

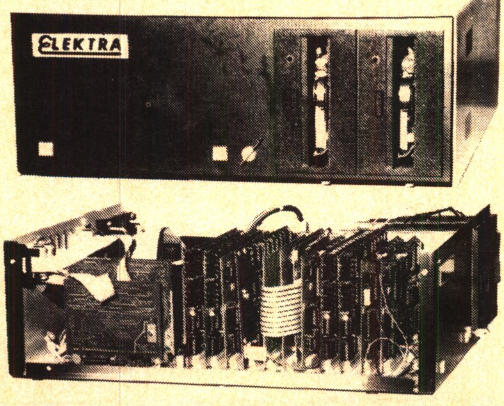
To use dl with piped input on standard input you must use the -z option. With this option a list of filenames to delete is read from the standard input path instead of from the command line itself. Examples for this command were given above.

That's about it for December. I hope you will find the tips and utilities useful and will join us in 1985 for more "KISS-able OS-9" tidbits. Until then, have a pleasant holiday season. May your stocking be filled with new OS-9 software.

Listing 1:

```
/* d utility 01.20 : directory with pattern matching          */
/*                   lists current directory with one         */
/*                   entry per line.                          */
/*                                                            */
/* CoCo OS-9 v01.00.00        Microware C Compiler            */
/*                                                            */
/* Copyright (c) 1984         Tim Harris                      */
/*                                         651 Pammel Court          */
/*                                         Ames, Iowa 50010          */
/*                                                                   */
/* uses stdout for output so it may be piped or redirected */
/* can be used with other utilities, i.e., dl (delete)       */
/*                                                                   */
/* Options:     -w        wild card matching                         */
```

ELEKTRA State Of The Art Computer Products



Quality Computer Systems for Software Development,
Process Control, Education, Science, Research, and Business.

Our Systems:
- Support 6802, 6808, and 6809 Microprocessors
- Run FLEX™, STAR-DOS™, and OS-9™
- Support Single User and Multi User

Winchester Systems (including removable cartridge models) available

AAA Chicago Computer Center • 120 Chestnut Lane • Wheeling, IL 60090

Technical consultation available 4 PM to 6 PM most weekdays.
Phone (312) 459-0450 Closed evenings and weekends

ELEKTRA is a trademark of AAA Chicago Computer Center
FLEX is a trademark of Technical Systems Consultants Inc
STAR-DOS is a trademark of STAR-KITS Software Systems Corp
OS-9 is a trademark of Motorola Inc and Microware Systems Corp

```
/*                      ? - single char wildcard          */
/*                      * - multiple char wildcard        */
/*            -?        help message                      */
/*                                                        */
/* Calls:     d         lists current directory           */
/*            d -w *.c  lists files ending in '.c'        */
/*            d -?      generates help message            */
/*        d -w c*       lists files beginning with 'c'    */
/*        d -w *c*      lists files with a 'c' in them    */
/*        d -w a?c      lists files abc,aec,a.c,...       */
/*        d -w ????     lists files with four chars       */
/*                                                        */
/* Calls with other utilities:                            */
/*   d -w *.c ! dl -z   deletes all files ending in '.c'  */
/*   d -w ??? ! wc -l   counts number of 3 char filenames */
/*   d ! sort           prints sorted directory           */
/*                                                        */

#include <stdio.h>
#include <ctype.h>
#define DREAD 129
#define ENTSIZ 32
#define TRUE 1
#define FALSE 0

/* Types for pattype */
#define REG 0       /* regular exact match w/ ? wildcard */
#define BOL 1       /* match at Beginning Of Line */
#define EOL 2       /* match at End Of Line */
#define MID 3       /* match in MIDdle of line */

char dname[2] = '.','\0';
int pattype = REG;       /* default to exact or ? match */
char pat[29];

main(argc,argv)
int argc;
char *argv[];
char c,fname[30],entry[32],*s;
int i,dp,woption=FALSE;

while (--argc > 0 && (*++argv)[0] == '-')
    for (s=argv[0]+1;*s!='\0';s++)
        switch(*s)
        case 'w':
            woption = TRUE;
            getpat(*++argv);
            break;
        case '?':
            help();
        default:
            printf(" d: illegal option %c\n",*s);
            exit(0);


if ((dp=open(dname,DREAD))==-1)
    printf(" Can't open default directory\n");
    exit(0);


while ((read(dp,entry,ENTSIZ))!=NULL)
    if (entry[0]!=0)
        i=-1;
        do
            c=entry[++i];
            fname[i]=toascii(c);
        while(isascii(c)!=FALSE && i<=29);
        fname[++i]='\0';
        if (fname[0]!='.')
            if (woption)
                if ((isin(fname))!= -1)
                    puts(fname);
            else
                puts(fname);
    close(dp);

help()

    printf("\n d: directory utility\n");
    printf(" lists current data directory, one entry per line\n");
    printf(" options: -w     wildcard matching\n");
    printf("                 ? - single char wildcard\n");
    printf("                 * - multichar wildcard\n");
    printf("           -?    help message\n");
    printf(" call:    d <-?  -w pattern>\n\n");
    exit(0);


getpat(s)
char s[];

    int ln,i,j=0;

    ln=strlen(s);
    ln--;
    if (s[0]=='*' && s[ln]=='*')
        pattype=MID;
    else
        if(s[0]=='*')
            pattype=EOL;
        else
            if(s[ln]=='*')
                pattype=BOL;

    for(i=0;s[i]!='\0';i++)
        if(s[i]!='*')
            pat[j++]=s[i];
    pat[j]='\0';


isin(s)
char s[];

    int i,j,k,ln,pl;

    switch(pattype)
    case REG:
        for(i=0;s[i]!='\0'&&(s[i]==pat[i]  pat[i]=='?');i++)
            ;
        if(pat[i]=='\0' && s[i]=='\0')
            return(i);
        else
            return(-1);
    case BOL:
        for(i=0;pat[i]!='\0'&&(s[i]==pat[i]  pat[i]=='?');i++)
            ;
        if(pat[i]=='\0')
            return(i);
        else
            return(-1);
    case EOL:
        pl=strlen(pat);
        ln=strlen(s);
        for(j=ln-pl,k=0;pat[k]!='\0'&&(s[j]==pat[k]  pat[k]=='?');j++,k++)
            ;
        if(pat[k]=='\0' && s[j]=='\0')
            return(j);
        else
            return(-1);
    case MID:
        for(i=0;s[i]!='\0';i++)
            for(j=i,k=0;pat[k]!='\0'&&(s[j]==pat[k]  pat[k]=='?');j++,k++)
                ;
            if(pat[k]=='\0')
                return(i);

        return(-1);
```

HARDWARE & PROGRAMS

MONITORS

BMC MEDIUM-RES COLOR

13" BMC w/ sound	$303.95
14" USI w/ sound	324.95
12" Taxon Composite & RGB	335.95

COMREX HI-RES MONOCHROME

12" Amber or Green	140.95
9" Amber or Green	125.95

Sorry, no C.O.D. on monitors.

COMPOSITE MONITOR INTERFACES

Double Driver	24.95
Video Plus	24.95

Both work great with color
or monochrome on CoCo I.

Coco Double Driver	28.95
Video Plus II M	26.95
Video Plus II C	39.95

For CoCo II Only

JARB DISK DOUBLER

Why spend twice as much as you need to for double sided diskettes? With our doubler, you can make your own and pay for it with the first box you double. A must for disk drive users.

5¼" size only	12.95

BASF DATA CASSETTES

	C-05	C-10
1-10	.60 ea.	.65 ea.
11-20	.55 ea.	.60 ea.

Soft Poly Cases	Ea. $.20
Hard Shelled Cases	Ea. $.22
Cassette Labels (12)	Sh. $.36
Cassette Labels Tractor (1000)	$21.95

MEMORY UPGRADE KITS

16K RAM CHIPS	1.50 ea.
5V, CoCo II 16K	1.95 ea.

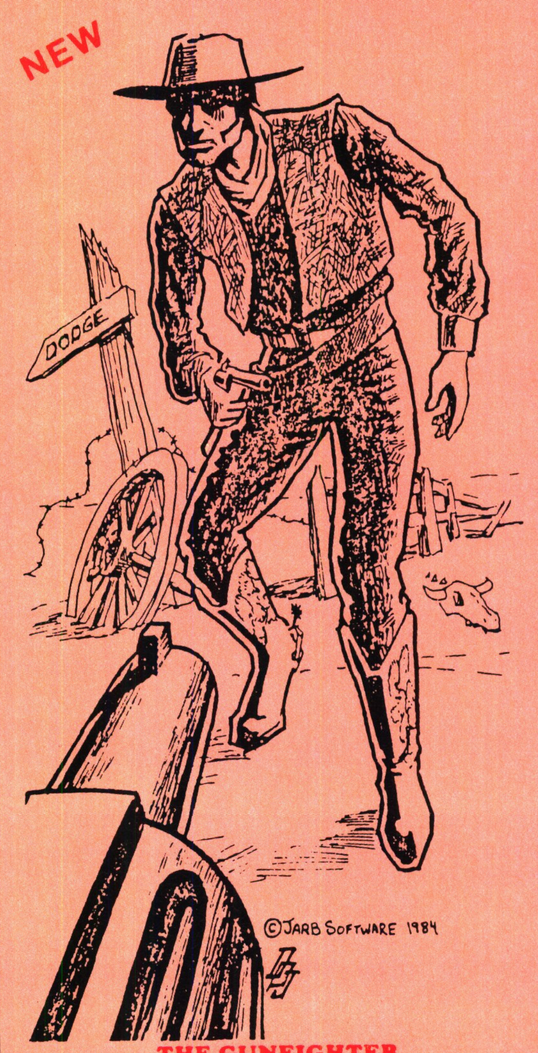
*64K RAM CHIPS

Eight 200 NS Factory Prime 64K RAM Chips. Allows you to upgrade 'all' board easily. No soldering needed....... $52.50

*16K/32K

Eight 200 NS Factory Prime Chips with Piggy Backed Sockets, Sam Socket, Bus Wire. Comprehensive Instructions. Recommended for "D" or earlier, but may be used on "E". Only 9 simple solder connections to kit. None to computer. $25.95

NOT FOR CoCo 2



THE GUNFIGHTER

BY Terry A. Steen

An excellent hi-res, arcade quality game program for two players. Joysticks and 32K are required in this all machine language program.

Cassette . $19.95 Disk/Amdisk . $24.95

JUNGLE TREK

Lost in a jungle with wild animals lurking; your only survival is to find a safe compound before you are lunch for lions; high resolution; multi-color.

16K EXT	$14.95

BIORHYTHM/PSYCHIC APT.

1) Prints biorhythm charts of nearly unlimited length; attractively formatted for use on most printers. 16K

2) Your psychic ability is determined through questions evaluating your psychic experiences

16K Ext .... Both for $15.95

PROGRAMS FOR THE SPECTRUM PROJECTS VOICE-PAK OR SPEECH SYSTEMS VOICE

TALKING FINAL COUNTDOWN

(by Bill Cook)

For 32K EXT	$19.95
Standard cassette FINAL COUNTDOWN	$14.95

TALKING SPELL-A-TRON

The program allows the user to build a dictionary of words. During testing, the words are spoken. If an incorrect response is given, the word is spoken again and spelled. Tape (32K EXT) $22.95

TALKING SCORE E-Z

A yahtzee type program. Up to six players can compete. All scoring and record keeping is done by the computer.

Tape (32K EXT)	$19.95
Standard SCORE E-Z	$15.95

TALKING COLOR MATH

The perfect educational game to aid the student in learning addition, subtraction, multiplication and division. Allows one to specify difficulty level.

Tape (32K EXT)	$22.95

TALKING SHIP HUNT

by Cobra Software

Play Battleship against your computer. 32K w/ joystick needed. Graphics and sound. Can be played without voice.

Cassette	$10.95

SCHEMATIC DRAFTING PROCESSOR (disk) can draw large scale schematics in hi-res (has six overlapping screens) and then print them out to any of several popular printers, fast!! A must for serious hardware computerist.

Now only...................... $49.95

CoCo Chips

Sam, Pia, CPU, Ext, Basic

We carry products
from many manufacturers.
If you don't see it, ask.

JARB SOFTWARE HARDWARE
1636 D Avenue, Suite C
National City, CA 92050

COD orders accepted, no charge cards please.
Shipping and handling $3.00
California residents please add 6% sales tax

Order Line
(619) 474-8982

After Hours BBS
(619) 474-8981

There's more to OS-9 than meets the eye.

File Handlers Toolbox **$85.00**

The File Handlers Toolbox: a new utility command toolbox specially designed for OS-9 users who do a lot of file manipulation. The package is a collection of twelve OS-9 command programs, including equivalents of some of the most popular UNIX* utilities that are not included in the basic OS-9 command set. Most of the programs are useful as "filters" using the OS-9 pipeline facilities.

Entertainment Pack **$85.00**

Entertainment Pack I is a collection of programs written in Basic09 for the OS-9 Operating System. The package consists of games and other interesting programs that are not only entertaining but serve as excellent instructional examples of Basic09 programming techniques. All programs include complete source files and can be easily edited to run on standard alphanumeric or graphics terminals.

CIS Cobol **$400.00**

CIS COBOL, which meets the ANSI standard for Level One Cobol plus selected features from Level Two, is ideal for microcomputers. This system lets you run Cobol on your small computer and is a great way to learn Cobol.

Relocatable Macro Assembler **$125.00**

At last — a full feature relocatable macro assembler and linkage editor for OS-9. RMA permits sections of assembly language programs to be independently assembled to "relocatable object files". The linkage editor takes any number of program sections and/or library sections and combines them into a single executable OS-9 memory module. Global data and program references are automatically resolved in the process. RMA also supports conditional assembly and library source files.

The Official OS-9 Manual Set **$40.00**

The complete, unabridged OS-9 manual set direct from Microware. This three manual set contains complete information on writing device discriptors, disk drivers and full explanations of how OS-9 works. A great addition to the serious OS-9 programmers library.

The BASIC09 Tour Guide **$18.95**

Map out your route through the Mercedes of Basics . . . Basic09 with **the official Basic09 Tour Guide.** Skillfully written in a friendly and easy to read style this book will put you in the drivers seat in no time. Fasten your seatbelt, sit back and enjoy the ride to perfecting your programming skills.

That's just the beginning . . .

GET EYE TO EYE WITH MICROWARE AND OS-9

microware®

OS-9 T.M.

MICROWARE SYSTEMS CORPORATION • 1866 N.W. 114th STREET • DES MOINES, IA 50322
TELEPHONE 515/224-1929 • TELEX 910-520-2535

OS-9 and BASIC09 are trademarks of Microware and Motorola. UNIX is a trademark of Bell Laboratories, Inc.

Listing 2:

```
he2s


* dl utility: enhanced delete utility
* modeled after 0S-9/68K delete utility
* CoCo OS-9  ver. RS01.00.00
* Copyright (c) 7/16/84  By: Tim Harris
*                            651 Pammel Court
*                            Ames, Iowa 50010
*
* Options:    -z  takes list of pathnames from stdin
*             -?  generates help message
*
* Calls:      dl fname  deletes file named "fname"
*             dl -?     gives help message
*     with use of enhanced d (dir) utility you can:
*              d ! dl -z   delete all entries in the dir
*     d -w *.c ! dl -z   deletes all entries ending in ".c"
*
          use /d0/DEFS/OS9Defs
          nam dl
* Data Area
EOF       equ 211
NLEN      equ 60
          org 0
FNAME     rmb NLEN
          rmb 200 stack size
          rmb 200 param size
DLMEM     equ
* Module Macro
          mod DLEND,DLNAM,DLTYP,DLREV,DLENT,DLMEM
DLNAM     fcs "dl"
DLTYP     set PRGRM+OBJCT
DLREV     set REENT+1
* Program Area
DLENT     lda 0,x get first param character
          cmpa #$0D is it c.r.?
          bne DL05 no, branch around
          bsr help yes, send help message, improper use
DL05      cmpa #'- is it a minus sign?
          bne DL20 no, use regular param delete routine
          lda 1,x yes, get next char
          cmpa #'z is it a 'z'?
          bne DL10 no, check for other option
          bsr zoption yes, use z routine
DL10      cmpa #'Z is it a 'Z'?
          bne DL15 no, check for other option
          bsr zoption yes, use z routine
DL15      bsr help go to help if ? or illegal option
DL20      os9 I$Delete delete the file
          bcs DL25 branch on error
          lda 0,x
          cmpa #$0D is it end of param list?
          bne DL20 no, delete more files
          clrb clear error status
DL25      os9 F$Exit end program
* Subroutines
help      lda #$1 set std. out
          leax HMSG,pcr get message
          ldy #HMLEN get length
          os9 I$Write write it out
          bcs h05 branch on error
          clrb clear error status
h05       bra DL25 exit program
*
zoption   clra set std. input
          leax FNAME,u point to buffer
          ldy #NLEN get max length
          os9 I$Readln read it in
          bcs z05 branch on error
          leax FNAME,u point to name again
          os9 I$Delete delete the file
          bcs DL25 exit on error
          bra zoption get more if no error
z05       cmpb #EOF is it EOF?
         bne z10 no, error out
         clrb yes, clear status
z10      bra DL25 exit program
*
* Help message
HMSG     fcb $0d,$0a
         fcc / dl: deletion utility/
         fcb $0d,$0a
         fcc / options: -z get paths from list on stdin/
         fcb $0d,$0a
         fcc /           -? help message/
         fcb $0d,$0a
         fcc / Call:   dl <options>  <fname>...<fname>/
         fcb $0d,$0a
HMLEN    equ *-HMSG
         emod
DLEND    equ *
         END
```

FIVE NEW EDUCATIONAL PROGRAMS!

FROM

CREATIVE TECHNICAL CONSULTANTS

AN ESTABLISHED LEADER IN

- **EDUCATIONAL PROGRAMS AND GAMES**
- **PROGRAMMING AND CLASSROOM UTILITIES**
- **CABLES AND JOYSTICK HARDWARE**

SUPER SPELLER. Students learn by playing spelling games with their own lists of spelling words and definitions, synonyms or antonyms. Grades 1-9.

MATH FLASH CARDS. A computer version of the time-proven flashcard technique for learning sums, differences, products and quotients. Grades 1-6.

MATH WORD PROBLEMS. Generate and solve unique word problems from your own list of subjects and objects. Menu offers choice of weights and measures, D = RxT, money or time. Grades 3-12.

METRIC MIND. A drill program in metric/English conversion with five skill levels. Grades 3-12.

ROMAN NUMERALS. A drill program in Roman/Arabic numeral conversion with five skill levels. Grades 3-12.

OTHER BEST-SELLERS FROM CREATIVE TECHNICAL CONSULTANTS

ALPHABET SOUP
CUSTOM FLASHCARDS
MUSICAL STRINGS

COLOR MATH QUIZ
FRACTION MATH QUIZ
DECIMAL MATH QUIZ

ALL OF THE ABOVE PROGRAMS ARE AVAILABLE ON TAPE FOR THE COLOR COMPUTER WITH 16 K EXTENDED BASIC. THE PRICE IS $15.95 EACH OR $41.95 FOR ANY THREE, PLUS $2.00 PER ORDER FOR SHIPPING AND HANDLING (U.S. FUNDS ONLY). SEND FOR FREE CATALOG WITH COMPLETE PRODUCT DESCRIPTIONS.

CTC

Creative Technical Consultants

P.O. Box 652 Cedar Crest, NM 87008

RAINBOW CERTIFICATION SEAL

RAINBOWTECH

hogg_wash

128K And FLEX

By Frank Hogg
Rainbow Contributing Editor

In a companion article, Dennis Lewandowski shows how you can add 64K to your CoCo to bring the memory up to 128K. Now the question is what to do with it. Of course, it would be nice to be able to use this with FLEX and OS-9, but there is a problem with OS-9 that is too complex to go into here. However, it is easy to use it with FLEX. In this column, I am going to discuss some thoughts on how this could be done, and next time I will provide a program to do it. I understand that Dennis' company, DSL, is doing a RAM Disk for FLEX.

Figure 1

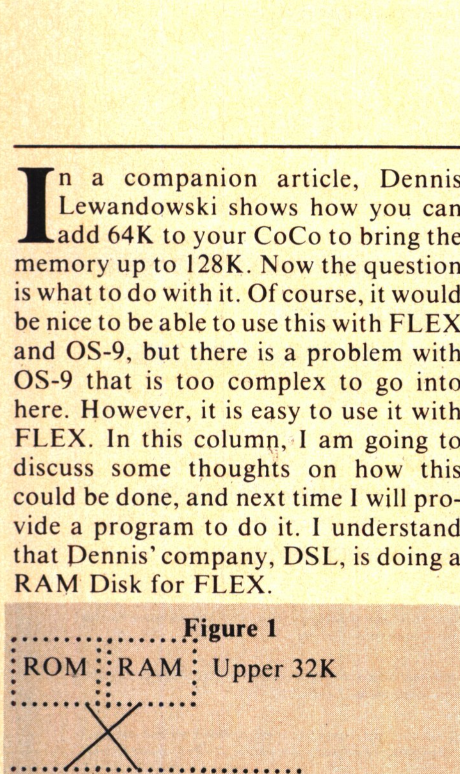


Figure 1 shows how the 128K is mapped into the system. Keeping in mind that the 6809 can only work with 64K at any one moment, we see that we can have either ROM or RAM in the upper 32K, which is nothing new, but we can now have any one of three 32K banks in the lower 32K. Both FLEX and OS-9 work by running the CoCo in the all-RAM mode where the upper 32K is RAM and the lower 32K is RAM. OS-9 uses memory in a very complex and rather slick way. While it is possible for OS-9 Level II to address more than 64K, it is done in a much more elegant way than we have here. The main shortcoming is that systems (Gimix, etc.) that support OS-9 Level II have hardware that allows the memory to be broken into 2K or 4K segments. The system puts these chunks together in various different physical pieces that look to the 6809 as a contiguous block of memory. OS-9 Level II has been designed to work with this type of fancy hardware. About the only thing that could be done that would be useful would be a memory disk for OS-9. This would also be handy for FLEX and is what Dennis is working on, but there is a simple way to implement the other two 32K banks or RAM with FLEX.

(Frank Hogg is the president of Frank Hogg Laboratory, one of the world's largest suppliers of software for 6809 based computers. He and his wife, Linda, live in Syracuse, New York.)

First the limitations: FLEX has a total of 46K user memory that is addressed from $0000 to $B7FF. We can switch the lower 32K, $0000 to $7FFF between the three different banks, but the memory from $8000 to $B7FF is part of the upper 32K of RAM that cannot be switched.

Doing It In XBASIC

It would be nice to have several Extended BASIC programs running that could switch from one to the other. The problem is that TSC's XBASIC uses all of the user memory and puts its stack at the top of user memory. A way around this would be to move MEMEND to $7FFF, which would allow switching without creaming XBASIC's stack. However, there are complexities involved with this. First, consider the state of Extended BASIC when the switch is made. If you did it by using *POKE*s, then you would jump from one running BASIC program into who knows where in another BASIC program. If you did it with an *EXEC* command from BASIC, you would have to preserve the return address stored in FLEX for the bank you were in and set up the return address for the bank you were jumping into. This whole thing is fraught with peril. However, it would provide an almost endless variety of ways to crash the system. A considerable amount of thought needs to go into this aspect of using the extra memory. This will be part of next month's article.

Another way that would be very easy to implement, and would be fairly safe, would be to simply *LOAD* programs that you are going to use into the differ-

Introducing NuBASE... the *uncomplicated* data base system.

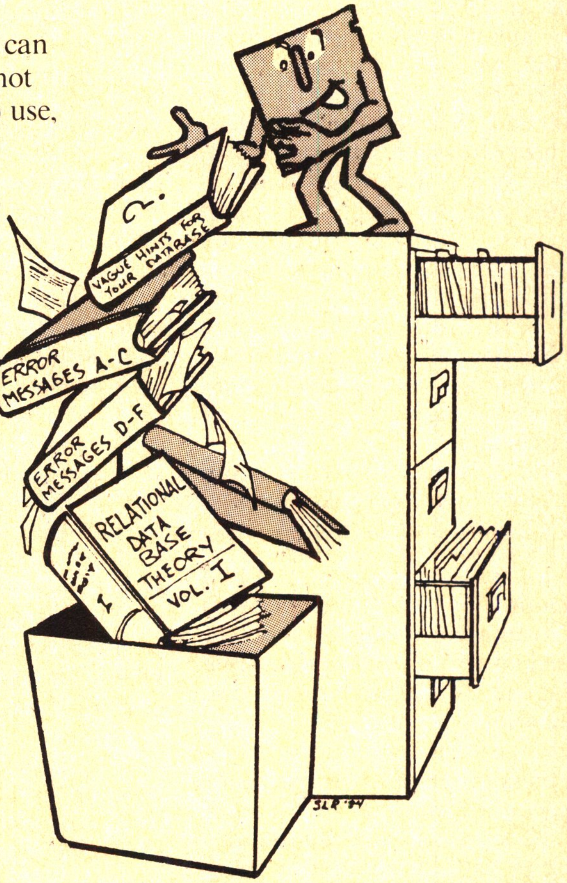
It lets you throw away all the books!

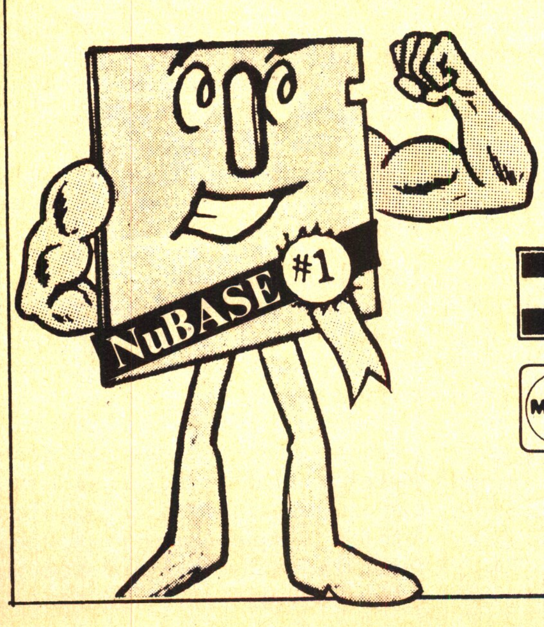
NuBASE is a DB manager so versatile that you can use it to do what you want with your data. It's not complicated or overbearing; in fact it's so easy to use, you'll be up and running in minutes.

Simple user-specified masks insure data accuracy. Data integrity is assured through the use of highly crash-resistant software. *See what you're doing* through the interactive generation of files, screens and reports.

NuBASE is as affordable as it is complete. There's nothing else to buy... $150 brings you the comprehensive package, including a ready-to-use mailing list application to get your **NuBASE** working for you on **day one.**

The computing power of NuBASE is limited only by the capacity of your hardware.


?
VAGUE HINTS FOR YOUR DATABASE
ERROR MESSAGES A-C
ERROR MESSAGES D-F
RELATIONAL DATA BASE THEORY VOL. I
SLR '84



VISA

MasterCard

Currently available for OS-9 Level II

For more information or to place an order, contact:

the JBM group

Dept. RB 15
The JBM Group, Inc.
Continental Business Center
Front & Ford Streets
Bridgeport, PA USA 19405
TWX: 510-660-3999

215-275-1777

PA res. add 6% sales tax.
US orders, add $5.00 postage and handling.

OS9 is a registered trademark of Microware Corp.

ent banks, and then just switch to the bank and jump to the warm start address of the program to use it. This could be called the poor man's virtual disk, and it does fit into a magazine article very nicely.

Let's look at the problems of doing this. Loading a program into memory is simple: you just *GET* it, as *GET 0.ED.CMD*. Now, you can't just jump to the program's start address, because it will tell you it needs a filename to edit. Most FLEX programs get their filenames from the command line. The sequence ED TEST first loads ED, and then ED runs, and the first thing it does is to look at the command line to get the filename of TEST. If we had ED in memory, and we knew its start address was $0100, we could just type *JUMP 100 TEST*. The JUMP command resides at $C100 and, therefore, will not crash ED. In order to use this with the 128K, we need to switch to the bank with ED in memory and then jump to the start address with a filename on the command line. We need a command that we will call BANK, which takes two arguments. The first is the bank to jump to and the second is the address to transfer. BANK with no arguments should return the bank we are currently in, in case we get lost in memory. The *piece de resistance* would be to make BANK memory resident so we would not have to access the disk every time we used it.

There is a block of memory at $FE00 that is not used by FLEX. It is 256 bytes long. We can write a program that will patch itself into the user command table and reside at $FE00 and do all the things we want to do. We could even try to preserve the warm start return address for each bank for possible use by BASIC.

While you are waiting for the next issue of THE RAINBOW for this program, you can play with the concept by using the MON command to switch banks and the GET and JUMP commands to try it out.

This would be very useful to the assembly language programmer. Writing assembly language is fun, but it can be a pain. After you test your program, you usually have to make a small correction, then reassemble it and test it again. This series of ED, ASM, TEST, ED, ASM, TEST etc., is a nuisance. With three banks to work with, we could load one with ED, one with ASM, and use the third for testing. Even doing BASIC programming, we could load one bank with BASIC and the other with ED and use the powerful editor instead of the one in BASIC. This technique could be used for any language development.

The one key thing you need to know is the cold start address of the programs you wish to use this way. You can find this by using the MAP command that is available with Ed/Asm or some other utilities, or you could refer to Figure 2 which has a listing of addresses for various popular programs. Caution: I have not had time to test any of these because of the magazine's deadline, so I will leave the fun part to you.

Figure 2

ED	$0000
ASM	$0003
XBASIC	$0000
DYNA-C	$0100
ABASIC	$0100
TSC EDIT	$0000
TSC ASMB	$0000

128K Another Way

After I started this article, I received a 128K board from RGS Micro. Their 128K board for the CoCo is similar to the DSL board but appears to have some additional capabilities. The two approaches are different. The DSL approach is one that you can do yourself for the least amount of money. The RGS board is more expensive but may be easier for the faint of heart. I would like to go into a good comparative review, but I didn't have the time to do it before this deadline. I can say that from what I've seen so far, I don't think you would be unhappy with either choice. Both techniques offer 128K, both will work with FLEX, and both will work with OS-9 as a RAM disk. I don't think that either will work like OS-9 Level II, but that is just my opinion. There are some pretty clever programmers that have surprised me in the past. I can say with some confidence that it won't be easy to get it to run like Level II. After all, it took Microware one year to get from Level I to II, and they had the source! However, a 64K RAM disk would be very useful in OS-9, FLEX or Disk BASIC.

Problems

The 128K boards remind me of when you had to modify your computer to get to 64K. In order to use 128K you will have to open your computer and break Radio Shack's precious seal. Well, if your computer is out of warranty, then there is nothing to lose. Some people think that they will have trouble trying to get their computer fixed at Radio Shack if they have modified it. This is probably true if the modification interferes with repairing the computer. If you fall into this category, then you should be prepared to remove any modifications before you return your computer to Radio Shack for repair. With this in mind, consider how you will accomplish the upgrade to 128K in a way that is reversible.

I modified an old 'F' board with the DSL mod, and it was easy and went off without a hitch. The mod is reversible. When I got the RGS board, it was for a CoCo 2. My CoCo 2 had the 64K RAMs soldered in! This would have made doing the DSL modification *very* difficult. You would have to remove the 64K RAMs and put in sockets. If you have a 16K CoCo 2 that was upgraded to 64K, then you should have sockets for the RAM chips. The only ones that didn't were the 64K CoCo 2s.

I heard from Bob Rosen at Spectrum Projects that there was a new board in the CoCo 2 that was different from my board. He said that it was smaller and that the chips were in different places.

I would suggest that you open your CoCo case and find out what revision board you have. Also note if the SAM (74LS83) and the 74LS244 are soldered in or in sockets. In my system the 74LS244 was soldered and I cut the pins from the chip and soldered a socket to those pins for the upgrade. (This was for the RGS upgrade.)

After you have this done, and with the open computer in front of you, call the company you wish to do business with and tell them what you have. This way, you will save yourself and them a lot of trouble.

The keyboard on my CoCo 2 had a small metal ledge that interfered with the RGS board. They are working on the problem, so check with them or DSL about your computer. As time goes by, these little difficulties will be worked out as they have been in the past.

It is not difficult to do this upgrade and the results are well worth it. Tune in next month for part two.

New Fix For DynaForm

We came up with a new fix for using *DynaForm* with printers that produce their own line feeds when they receive a carriage return.

Problem: *DynaForm* was designed to create boldface, underline, and double strike by controlling the carriage returns and line feeds of the printer. To do boldface for example, *DynaForm* will print the line normally, then print a carriage return, then the word or words that are to be boldfaced. This is repeated four times for boldface, two times for double strike, and for underline it just prints an underline. Because of this, *DynaForm* requires a printer that does *not* produce a line feed when it gets a carriage return from the computer. This flies in the face of Radio Shack OS-9's standard of doing just the opposite. We printed a quick fix that filtered the output of *DynaForm* to strip any line feeds, but this was a pain to use and did not work on the CoCo for some reason.

New Solution — while you are waiting for the new release of *DynaForm* that will really fix this and, by the way, make several improvements, we have discovered a better temporary fix that works . . . almost.

While talking to a user on the phone, it dawned on me that we could probably just null out the line feed in *DynaForm* to cure the problem. This had the advantage of being user-fixable with debug. Hot on the trail, I dug out the listing of *DynaForm* and started to look for the line feed variable. It turned up at offset $0FE1. Just change the $8A to a $80 and we're set. Well, it didn't quite work, so back to the listing, where I found *DynaForm* was sending a bunch of line feeds to bring it to the bottom of the page. Change this to a carriage return and we are all set — almost. Changed offset $0530 from a $27 to a $28 and tried it again. Here is where the 'almost' came in. Everything worked fine, but the pages were short by two lines. Well, after going blind and getting sleepy, I decided to be lazy and just tell you to put '.PL 68' in your file to accommodate the lost two lines, and it would work. It is not as elegant as I would like, but we should have the new *DynaForm* in a month or so, and this was just going to be a quick fix anyway, and I was getting tired, and on and on. Anyway, here is the procedure for the fix.

```
OS9:load df
OS9:debug
Interactive Debugger
DB:l df
    0000 87
DB:. .+530
    0530 27
DB:=28
    0531 78
DB:. .+FE1-530
    0FE1 8A
DB:=80
DB:. .+1327-FE1
    1327 28
DB:=EE
    1328 BE
DB:=13
    1329 E8
DB:=1C
    132A
DB:Q
OS9:ident df -m
OS9:del -x df
OS9:save /d0/cmds/df df
```

The ident will just confirm that the CRC is good. If not, then you did something wrong. Below is a comparison of the "before" (#1) and the "after" (#2) files. The last three numbers are the CRC values. I had you change them to avoid having to use verify after you save this file. If the ident showed the CRC as good then save this to your CMDS directory with a new name, or first delete the original and use the old name. I'll leave that up to you.

You will not be able to use the built-in boldface, underline and double strike until we get the new version to you. This fix is limited.

Now all you have to do is put '.PL 68' in your files and everything will proba-

TITAN SOFTWARE(TM)
THE POWERFUL ONE

Highly Sophisticated "IDEAL HOST" Complex & "TELEREMOTE Executive" (Terminal) PGM.
INCLUDES: STAR KIT'S "REMOTERM" & "COLORTERM"
LICENSED TO TITAN SOFTWARE (TM).
(36 GRANULES OF SHEER GOLD)
REMOTE CONTROL & COMMUNICATION PGM.
Attribute "MAIN FRAME" Capabilities to any 32K. Ext. Bas. & Two Disk Drives.
Recycle Automatically after "SIGNOFF"
Our "TELETERM" Pgm as any: "Smart", or "Dumb" Terminal Operates the "Host" Computer, (unrestricted "REMOTE CONTROL") – Running Own, or HOST's Disk Drive PGM's. Communicates (TWO Way) Leaving or Retrieving Files (Upper & Lower Case) as a TELE-REMOTE — even traveling — EXECUTIVE, Secretary, or Sales Representative. "TELETERM" Communicates with other HOST & BBS Systems too.
Host System Intercepts UNAUTHORIZED INTRUDERS by: I.D.#, PASSWORD & "PRIVATE" Message Codes. (Up to half "$" each). Automatic Loading to the Computer's Memory-Range & Semi Automatic Setting of Communication-Protocols and Printer-Parameters. AUTO-Select MENU driven PGM.
"FILE HANDLER": Prepare, Convert, Load, Save & Transmit ALL TYPES of FILES.
"MINI EDITOR": Word Processor: Load, Edit & Save "File Handler's" & most Word-Processor Files.
Library Quality Gold Embossed Binder EDITION 32K. Ext. Bas. Dsk. $85 First Class S&H $4.50
COMPOUND the AWESOME POWER of TWO MAIN FRAME Capabilities, by TWO
Mutually REVERSIBLE HOST-TERMINAL SOFTWARE.
A Set of Two Host-Terminal Complex PGM., in one "GOLD EMBOSSED BINDER" $148 First Class S&H: On Us!!

HANDLER COMPLEX (18 Granules of Sheer Gold)
I. DISK HANDLER - Fast, Reliable, Garbage Free, Discretionally "VERTIFIED". AUTO-Selective MENU driven PGM. Loading.
a. Error Free Disk Backup.
b. Selective PGM. (C)opy or (S)kip.
c. Solo-Pgm-Copy from DISKS.
d. "DISK ERASER" Faster than DSKINI, WIPES Disks CLEAN.
e. "DIRECTORY" PRINT: on Screen & Printer.
f. "DIR TRACK 17" PRINT: shows "LEFTOVER" Dir. & PGM. Garbages.
"Disk Handler" Pgm. makes 'Garbage Free' Copies, from "Garbage FULL" Floppies.
II. FILE HANDLER - is the same pgm., as in the "HOST COMPLEX".
III. MINI-EDITOR - is the same as in the "HOST COMPLEX".
Library Quality Gold Embossed Binder EDITION 32K. Ext. Bas. Dsk. $48 First Class S&H $4.00

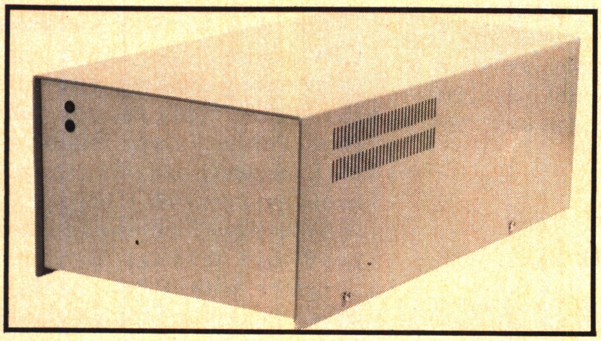
CONVERT COMPLEX (11 Granules of Sheer Gold)
I. Highly Reliable & Fast Programmer's Helper AUTO-Selective MENU driven Program Loading.
II. Highly Sophisticated and Very Fast COMPUTER MEMORY X-RAY (RAM & ROM) With or Without Program Loaded. With Programs Loaded Acts as a "COMPUTER LANGUAGE ANALYZER". Columnar LISTING of Numerical Systems on Screen or Printer.
Library Quality Gold Embossed Binder EDITION 16K. Ext. Bas. Dsk. $38 First Class S&H $4.00

For more EXPLICIT 9 Page Brochure of all TITAN SOFTWARE PROGRAMS
Send $1.00 and a Self-Addressed 40¢ Stamped Envelope to:
508 West Avenue, Northvale, New Jersey 07647 (201) 768-7479 6 P.M. - 10 P.M. EST.
Money Orders, Checks Accepted. New Jersey residents add 6% Sales Tax.

DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES

PRICE BREAKTHROUGH

Super Sale on New Hard Drives



Warranty - One Full Year

Introducing

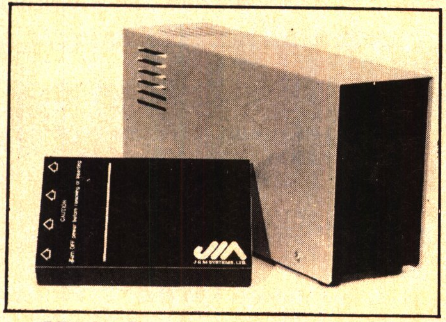
MEGADISK™

Winchester Hard Drive ready to run on the TRS 80 Model I/III/IV/4P, Color Computer, I.B.M.-PC, Apple, Franklin, Max/80.
Software Drivers: LDOS, NewDos/80, Dosplus, TRSDOS 6.0, CP/M

CALL FOR NEW LOW PRICE

DRIVE A HARD BARGAIN™ **Complete Systems Starting at ~~$999.95~~ 899.95**

Call Toll Free Ordering 1-800-343-8841



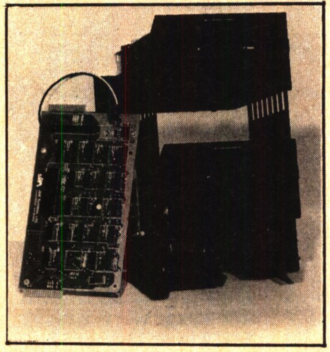
High Quality Lowest Price

Drive 0, 1, 2, 3

for the

Color Computer

Starting at ~~$199.95~~ CALL FOR NEW LOW PRICE



Disk Drive Upgrade

for Model III/IV easy to install system

Starting at ~~$309.95~~ CALL FOR NEW LOW PRICE

SOFTWARE SUPPORT, INC.

1 Edgell Road, Framingham, MA 01701 (617) 872-9090 Telex-383425
Hours: Mon. thru Fri. 9:30 am to 5:30 pm (E.S.T.) Sat. 10:00 am to 3:30 pm

DEALER INQUIRIES INVITED.

TERMS:
M.C./Visa/Amex and personal checks accepted at no extra charge.
C.O.D., please add $3.00.
Shipping: Please call for amount.
Not responsible for typographical errors.
Prices subject to change.

CANADA
MICRO R.G.S. INC.
751, CARRE VICTORIA, SUITE 403
MONTREAL, QUEBEC, CANADA, H2Y 2J3
Regular **Tel. (514) 287-1563**
Canadian Toll Free 800-361-5155

Service! Service!

All in stock products are shipped within 24 hours of order. Repair/Warranty service is performed within 24 hours of receipt unless otherwise noted. We accept C.O.D., foreign and APO orders. School and D&B corporate P.O.s accepted.

TRS/80 Registered Trademark Tandy Corp. Apple Registered Trademark Apple Computer Corp
IBM-PC Registered IBM Corp. Franklin Registered Trademark Franklin Corp. Max/80 Registered Trademark Lobo Int.
LDOS Reg. Logical System Inc. Dosplus - Micro Systems Software Newdos/80 - Apparat Inc.

DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES

DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES

PRICE BREAKTHROUGH

Super Sale on New Disk Drives

Starting at ~~$169.00!~~ CALL FOR NEW NEW LOW PRICE

Tandon — Siemens — Remex — MPI — Teac — Shugart

40 or 80 Tracks — Single or Dual Head

IBM/PC — TRS/80 — Sanyo Computers -----$Call

Drive a Hard Bargain™!! For your TRS/80, Color Computer, IBM, Apple, Franklin, Max/80, Complete Systems.....from ~~$999.95~~ 899.95 CALL FOR NEW LOW PRICE

PLEASE CALL FOR OUR MOST CURRENT PRICE REDUCTIONS.

TOLL FREE ORDERING
1-800-343-8841

GENERAL AND TECHNICAL
1-617-872-9090

Disk Drives (0123) TRS/80-IBM-Apple-TI-Franklin-Max/80-LNW ◄
Model I/III/IV Upgrade (Disk Drives - Memory) ◄
Printers—Daisywheel/Dot Matrix ◄
Double Density Controller (Model I) ◄
Color Computer Printer Interfaces ◄
Disk Drive Operating Systems ◄
Repair Services Now Offered—FAST Turn-a-Round ◄
Apple/Franklin Compatible Add-On Drives with Case & Cable ◄
Diskettes — Lifetime Guarantee — **Low-Low Prices** ◄
DISK DRIVE CASES AND POWER SUPPLIES (5 year warranty) ◄

CALL TOLL FREE FOR NEW PRICES

Printer **Buffers 8K to 512K** ... **starting at $143.95**
Model I/III/IV Speed-up Mod ... **starting at $75.00**
Cables—Printer/Disk Drive ... **starting at $16.00**

Warranty on Disk Drives — 1 Full Year Parts and Labor

SOFTWARE SUPPORT, INC.

1 Edgell Road, Framingham, MA 01701 (617) 872-9090 Telex-383425
hours: Mon. thru Fri. 9:30 am to 5:30 pm (E.S.T.) Sat. 10 am to 3:30 pm

DEALER INQUIRIES INVITED.

TERMS:
M.C./Visa/Amex and personal checks accepted at no extra charge.
C.O.D., please add $3.00.
Shipping: Please call for amount.
Not responsible for typographical errors.
Prices subject to change.

CANADA
MICRO R.G.S. INC.
751, CARRE VICTORIA, SUITE 403
MONTREAL, QUEBEC, CANADA, H2Y 2J3
Regular Tel. (514) 287-1563
Canadian Toll Free 800-361-5155

Service! Service!

All in stock products are shipped within 24 hours of order. Repair/Warranty service is performed within 24 hours of receipt unless otherwise noted. We accept C.O.D., foreign and APO orders. School and D&B corporate P.O.s accepted.

TRS/80 Registered Trademark Tandy Corp. Apple Registered Trademark Apple Computer Corp
IBM-PC Registered IBM Corp. Franklin Registered Trademark Franklin Corp. Max/80 Registered Trademark Lobo Int.
LDOS Reg. Logical System Inc. Dosplus - Micro Systems Software Newdos/80 - Apparat Inc.

bly work. Let me know how you made out.

By the way, we will be sending out free updates to all U.S. customers who bought *DynaForm*. Just send in your disk with proof of purchase (invoice etc.), and we'll ship it as soon as it is ready. Try not to call, because the ladies who answer the phone get mad at me when I leak information on a product before it is ready to ship.

Differences

byte	#1	#2
00000530	27	28
00000FE1	8A	80
00001327	28	EE
00001328	BE	13
00001329	E8	1C

Bytes compared: 0000132A
Bytes different: 00000005

Printer Control Characters

DynaStar and *DynaForm* support embedded control codes, but we did not do a good enough job of telling you how to use them in the manual, so let me go over it here.

DynaStar has a special feature that is invoked by typing a control P. When you do this, *DynaStar* waits for a control character to be typed by you. If you don't type a control character, then *DynaStar* thinks you want to cancel the operation and goes back to whatever it was doing. Suppose you wanted to send the control code $1D to your printer. $1D is a control] (that is, control key and a closing bracket), so in *DynaStar* type a control P and a control]. You will see a funny triangle-shaped character followed by a ']'. This is the indicator that you have embedded a control] in the text file.

When *DynaForm* processes the file, it looks for that funny triangle (a $80 by the way), and when it sees it, it knows that the next character is a control character that is to be sent to the printer, which it does. You have to precede each control character with a control P, and if you need to send regular characters after the control character, then just type them in. For instance, if you wanted to send a ESC then a 'p' then a control Q to your printer, you would type control P, ESC, p, control P, control Q. It would look like this on the screen (Substitute '^' for the triangle):

^[p^Q

Get the picture? Play with it for awhile, and you will see that you can do just about anything with this feature.

Disk Drive Advice

At the Princeton RAINBOWfest, we were swamped with questions about what type of disk drives to buy. The choices are getting very complicated, and the prices are getting very low. I was talking to Bob Phillips at Gimix, and he told me that there were 35 Japanese disk drive manufacturers in the market. The competition is fierce, and this means that prices have dropped to the point that anyone can afford to buy any kind of drive they might want. As an example of this, we are buying 80-track, double-sided, half-height drives, guaranteed by the manufacturer for one year, for less than we were buying single-sided, 40-track, full-size drives six months ago.

When you look at how the prices have dropped, you might decide to wait and see if they are going to drop any more. I have been told by people in the know that even the Japanese cannot make drives at these prices for long, and that as soon as inventories get back to normal, prices will either go up or stay at this level. However, nobody really knows

OS-9™ SOFTWARE FOR COCO

SDISK—Standard disk driver module allows the use of 35, 40, or 80 track single and double sided drives with CoCo OS-9 plus you gain the ability to read/write/format the standard OS-9 single and double density disk formats used on other OS-9 systems. **$29.95**

BOOTFIX—To make bootable double-sided disks **$9.95**

SDISK + BOOTFIX—when ordered together **$35.95**

FILTER KIT #1—Eleven utilities used as filters (with pipes) to give you "wild card" directory lists, copies, deletes, moves, lists, pagination, etc. **$29.95**

FILTER KIT #2—Command Macro Generator to build new commands by combining old ones, and 9 other utilities. **$29.95**

HACKER'S KIT #1—Disassembler and memory dump/fill utilities allow you to disassemble OS-9 assembly code from disk or memory. **$24.95**

Send SASE for current catalog.
Terms: Prepaid check, MO, Visa, Mastercard or COD.
Add $1 S&H, (COD $3 extra).

D.P. Johnson, 7655 S.W. Cedarcrest St.
Portland, OR 97223 (503) 244-8152
(We appreciate your calling between 9-11 AM Pacific Time.)

OS-9 is a trademark of Microware and Motorola Inc.

One-Liner Contest Winner . . .

Here's a one-liner "CoCo clock" to be used as a timer or stopwatch. It can also be used as a subroutine in game programs where it may be necessary to keep a running count of time. Please note it may be necessary to adjust the "V" variable, depending on the actual timing of each CoCo. Just type in the listing and *RUN*.

The listing:

```
2 IFQ=0THENCLS:PRINT@168,"HOUR :
MIN: SEC":V=1.689:TIMER=65000:Q=
1:GOTO2ELSEA=TIMER:IFC>A THENX=X
+(65535-C):C=0:GOTO2ELSEB=A-C:C=
A:X=X+B:Y=INT(((X/100)*V)-1098):
H=INT(Y/3600):F=Y-(3600*H):M=INT
(F/60):S=F-(60*M):PRINT@234,H;":
";M;":";S:GOTO2
```

Don Anneken
Burlington, KY

(This one-liner contest winner will receive a copy of *The Rainbow Book Of Adventures* and its accompanying tape.)

for sure just what is going to happen. The best thing to do is buy a name brand drive from a company that will be around for awhile. You will want to get service on the drive someday, although at these prices they are almost disposable.

What size? How many tracks? Single-sided or double? Let me simplify this for you. There are only a few differences between the various drives available. They are: Tracks per inch are either 48 or 96. The standard RS drive is 48tpi. This also holds true for 40-track drives, whether single-sided or double. The number of tracks per inch is the same. The 96tpi drives are usually referred to as 80-track drives. Some companies confuse the issue by calling double-sided 40s, 80-track drives. But they also call double-sided 80s, 160-track drives. All 48tpi drives are compatible. You can put a single-sided disk in a double-sided drive, and it will read it. The other way won't work, unless you formatted the disk as single-sided. What this all means is that double-sided, 40-track drives are completely compatible with the standard Radio Shack drives and operating system. You only get complicated when you get to the 96tpi.

The differences between single and double-sided drives are as follows. Disk BASIC reads and writes to one side of the disk, 35 tracks. It really doesn't matter what type of drive you have in the system; it will treat it as a single-sided, 35-track disk. This means that all drives will work, but that anything over 35-track, single-sided will be of little use to you if all you use is Disk BASIC. (RAINBOW printed patches to Disk BASIC to use the other side and 40 tracks in a past issue.) If you use FLEX, then it will use any drive currently on the market to its fullest. If you use OS-9, then you will need either SDisk from D.P. Johnson or a similar program from Computerware or other vendors.

My personal favorite is two half-height, double-sided, 40-track drives, in a single vertical case. The price drop on the 80s would make me consider them, but if I did, I would have to keep a 35 or 40 around for copying files to and from standard Radio Shack disks.

Here are some storage comparisons with OS-9 disks:

SS RS 35 track	630 sectors
SS 40 track	720 sectors
DS 40 track	1,440 sectors
DS 80 track	2,880 sectors

This shows that a double-sided 80 has over four-and-a-half times the storage as the standard RS disk. Three of these can be put on the system for a total of 8,640 sectors, or over 2 megabytes of storage! By comparison, four Radio Shack drives have only 2,520 sectors, or 6/10 of a megabyte. If you compare the cost per byte of storage, the 80s come out the best, but the inconvenience may not be worth it. That is why I like the DS 40s. Plenty of room plus compatibility.

What about hard disks? RGS is supposed to be getting a hard disk for us to play with; Dale Puckett is doing a review and then we get to try it. I guess how soon we get it will depend on how much Dale likes it. I will let you know.

That's it for this column. I have been spending my summer sailing and driving a bulldozer over land that will have our new log home on it next year if the banks cooperate. Because of this, I have been lax in writing my column. The next few columns on the 128K upgrades should be a lot of fun to do and read, so I hope that I am forgiven for playing in the sun instead of with my CoCo.

Till next month . . .

SUPPORT:

(sə·pôrt) v.t. **1**. To bear the weight of, especially from underneath; uphold in position; keep from failing, etc. **2**. To bear or sustain (weight; etc.) **3**. To keep from failing; strengthen: *PBJ, Inc. supports their product line with technical personnel that are always there to help you.* **4**.To serve, to uphold or corroborate (a statement, theory, etc.) substantiate; verify: *PBJ, Inc. receives testimonials on a daily basis that support their product line.* **5**. To provide (a person, institution) with maintenance; provide for: *PBJ, Inc. supports the CoCo user by consistently creating new advancements in their field.*

Synonym: **PBJ, Inc.**

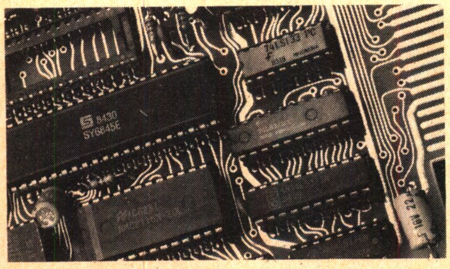
A long description indeed, yet very applicable to the kind of service delivered by PBJ, Inc. When the serious CoCo user needs back-up support, technical information or assistance, PBJ, Inc. is there! From the products they manufacture through to the strategic solutions they offer, PBJ, Inc. has rightfully gained the reputation of "the company with *the most support* for the Color Computer."

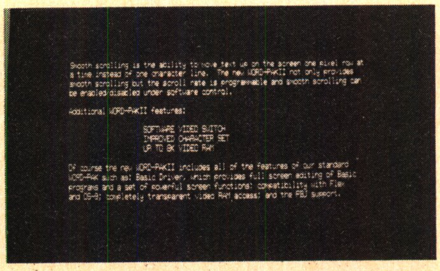
"Innovative Products for the CoCo User"

pbj inc.

Call or write today for our **FREE** Catalog . . .
P.O. Box 813 • North Bergen, N.J. 07047 • **201-330-1898**

*Derived from *Funk & Wagnall's International Dictionary*



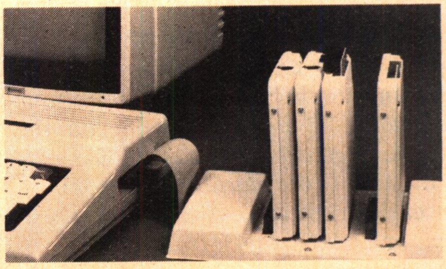


Smooth scrolling is the ability to move text up on the screen one pixel row at a time instead of one character line. The new WORD-PAKII not only provides smooth scrolling but the scroll rate is programmable and smooth scrolling can be enabled/disabled under software control.

Additional WORD-PAKII features:

SOFTWARE VIDEO SWITCH
IMPROVED CHARACTER SET
UP TO 8K VIDEO RAM

Of course the new WORD-PAKII includes all of the features of our standard WORD-PAK such as: Basic Driver, which provides full screen editing of Basic programs and a set of powerful screen functions; compatibility with Flex and OS-9; completely transparent video RAM access; and the PBJ support.



PERSONABLE PASCAL

What Goes In Must Come Out

By Daniel Adams Eastham
Rainbow Contributing Editor

Getting data into the computer and the results back out is a problem that every program must tackle. Where this problem is solved is usually split somewhere between the programming language and operating system. Some programming languages like ALGOL and C don't even have I/O (short for Input/Output) defined as part of the language. Others, like ADA, incorporate everything you need including I/O and multitasking right in the language. PASCAL, on the other hand, is somewhere in between with a small I/O interface defined as part of the language.

Files

The primary language element for supporting I/O is the file. A file is a data structure (type) which is very similar to an array. An array is a fixed sized collection of similar data types which can be accessed in any order (randomly). A file is a variable sized collection of similar data types which can only be accessed in one order (sequentially). For example:

```
VAR MyFile : FILE OF Real;
```

This statement declares a variable MyFile as a file of real numbers. You notice that there is no indication of the number of real numbers in this file. You can make a file of any type except for a type which is itself a file or contains a file. For example:

```
VAR MyData : FILE OF RECORD
                        Name : String (30);
                        Addr : String (50);
                        Zip : Real;
                     END;
```

In practice, you would usually declare a specific type with a TYPE statement and then declare a file variable of that type's name. For example:

```
TYPE MyDataType: RECORD
                          Name : String (30);
                          Addr : String (50);
                          Zip : Real;
                       END;
VAR MyData: FILE OF MyDataType
```

Creating And Putting Data Into A File

Before accessing the file, you need to specify whether you will be putting data into it or getting data from it. For example:

```
REWRITE(MyFile,'MYREALS/DAT:1');
```

This statement causes the following sequence of events to occur:

1) If the file *MYREALS/DAT* on disk drive 1 existed before, it is now killed.
2) A new, empty file *MYREALS/DAT* is created on disk drive 1.
3) The file variable MyFile is associated with the disk file *MYREALS/DAT* on disk drive 1.
4) The file variable MyFile is put into a write-only mode.

Once you have done this, you are ready to add elements to this empty file. Although a file is made of (possibly) a large number of elements, you can only access one at a time. This is done by using the file variable name followed by the circumflex, or up arrow (^). For example:

```
MyFile^ :=23.5;
```

This statement causes the real value 23.5 to be placed in the current element of MyFile. Once you have placed this value in the current element, you are ready to advance to the next element. This is done with the Put procedure as follows:

```
Put (MyFile);
```

(Daniel Eastham holds a B.S. in computer science and has 13 years experience in systems and communications programming including work on the original Telenet packet switching network. He is the author of the DEFT Pascal Workbench *and is currently president of Deft Systems, Inc.)*

This causes the current element to be added to MyFile with the current element then becoming undefined. You continue to assign values to the current element of the file and add that element to the file until you have placed all the data that you want into the file. At this point you will need to close the file.

```
Close (MyFile);
```

Although standard PASCAL does not include a close procedure, many PASCALs (including DEFT PASCAL) require one in order to ensure that all data has been written to the disk and that the disk directory has been updated. A final example shows how to create a file, put three elements into it and then close the file:

```
REWRITE(MyDate,'NAMEADDR/DAT');
MyData^.Name := 'John Doe';
MyData^.Addr := 'Main Street';
MyData^.Zip := 12345;
Put (MyData);
MyData^.Name := 'Mary Jones';
MyData^.Addr := 'Maple Avenue';
MyData^.Zip := 54321;
Put (MyData);
MyData^.Name := 'Last Name';
MyData^.Addr := 'Last Address';
MyData^.Zip := 11111;
Put (MyData);
Close (MyData);
```

This example creates the file *NAMEADDR/DAT* on disk drive 0 and puts three records on the file. You can see that once you have dereferenced the file variable, it acts just like a regular variable of the file's type.

Reading An Existing File

Once we have created a file, we will want to go back and read it. First we must RESET the file as follows:

```
RESET (MyFile, 'MYREALS/DAT:1');
```

This statement causes the following sequence of events to occur:

1) The file variable MyFile is associated with the disk file *MYREALS/DAT* on disk drive 1.
2) The file variable MyFile is put into a read-only mode.
3) The file variable MyFile is positioned to the beginning of the file *MYREALS/DAT* on disk drive 1 and the first element of the disk file is transferred to the file variable MyFile.

Once we have done this, we are ready to read data from the file, one element at a time. In fact, the first element of the file has already been read into the file variable as a result of the RESET statement. To access it, you merely dereference the file variable with the circumflex or up arrow (^). For example:

```
Total := Total + MyFile^;
```

This adds the current element of the file to the variable Total. To position to the next element of the file you use the Get procedure:

```
Get (MyFile);
```

For example, suppose we had three elements in the file MYREALS/DAT and wanted to add them up. We could use the following code:

```
Total := 0.0;
FOR I := 1 TO 3 DO BEGIN
  Total := Total + MyFile^;
  Get (MyFile);
  END;
```

But suppose we didn't know how many elements were in the file *MYREALS/DAT*? In this case, you use the built-in function EOF (End Of File) to test whether there are more elements in the file. For example:

```
Total := 0.0;
WHILE NOT EOF (MyFile) DO BEGIN
  Total := Total + MyFile^;
  Get (MyFile);
  END;
```

This code allows you to total all the numbers in the file no matter how many there are (even if the file is empty!). When the EOF function becomes TRUE, the current element in the file variable becomes undefined. This means that if you RESET an empty file, the current element is undefined and the EOF function is TRUE immediately afterward.

READ and WRITE

Because you frequently have the sequence:

```
variable := filevar^;
Get (filevar);
```

PASCAL has a READ statement which collapses these two statements into one. For example:

```
READ (filevar, variable);
READ (filevar, var1, var2, var3);
```

The first statement is equivalent to the two statement examples above. The second statement is equivalent to:

```
READ (filevar, var1);
READ (filevar, var2);
READ (filevar, var3);
```

In addition, there is also a WRITE statement which does for PUT what READ does for GET. For example:

```
filevar^ := variable;
Put (filevar);
```

is equivalent to:

```
WRITE (filevar, variable);
```

You can also use multiple arguments just like on the READ.

Text Files

There is a special pre-defined file type text which is frequently used in PASCAL. It is defined as follows:

```
TYPE Text = FILE OF Char;
```

Text files are standard ASCII files on disk and cassette and they are also used to represent the keyboard, screen and printer. While you would normally only be able to access individual characters in such a file, text files are also thought of as containing lines and you can access integers and reals as well as characters. This is done by extending the capabilities of READ and WRITE statements and adding READLN, WRITELN and EOLN to the language.

There are two pre-defined text files that you have been using all along. They are INPUT and OUTPUT. When you don't specify a file variable in a GET, READ, READLN, EOF or EOLN statement, the compiler assumes that you are using the INPUT text file. When you don't specify a file variable in a PUT, WRITE, WRITELN, CLOSE or PAGE statement, the compiler assumes that you are using the OUTPUT text file. These files are normally automatically initialized as follows:

```
RESET (INPUT, ':-3');
REWRITE (OUTPUT, ':-3');
```

When using DEFT PASCAL, it is not recommended that you use RESET or REWRITE with the INPUT or OUTPUT text files since certain optimizing assumptions have been made about these files.

READ And READLN

When using READ with a text file, you can specify integer, real and Boolean variables as well as character variables. When you do this, the file is scanned a character at a time, looking for the next legal integer or real number representation in ASCII (in DEFT PASCAL, Booleans are read as 0 or 1). When it is found, it is converted to the corresponding internal binary value and stored in the specified variable. If you have more than one variable in the READ statement, this process is repeated for each one. For example:

```
READ (TextFileVar, I, R, CharVar);
```

This statement scans the file associated with TextFileVar for an integer (I) then a real (R). After that, the next character is put in CharVar. Note that scanning continues until all variables have been filled even if it means scanning more than one line.

The READLN statement is exactly the same as the READ statement except that after all the variables have been filled, scanning continues until an End Of Line character has been read. The current element (character) of the file will then be the character following the End Of Line character.

DEFT PASCAL also allows you to read an enumerated type as though it is an integer and to read into a variable length string. All the characters encountered until either the string is filled or an End Of Line character is encountered are stored in the string. It is recommended that you use READLN to read string variables.

EOLN

The EOLN function is used to test whether the current element of the text file (next character to be read with a READ or READLN) is the End Of Line character. For example:

```
WHILE NOT EOF (TextFile) DO BEGIN
  WHILE NOT EOLN (TextFile) DO BE-
  GIN
    READ (TextFile, CharVar);
    . . . do character stuff
    END;
  READLN (TextFile);
  . . . do line stuff
  END;
```

In this example, the outer WHILE loop executes once per line. The READLN statement is used to skip over the End Of Line character (a carriage return in DEFT PASCAL).

WRITE and WRITELN

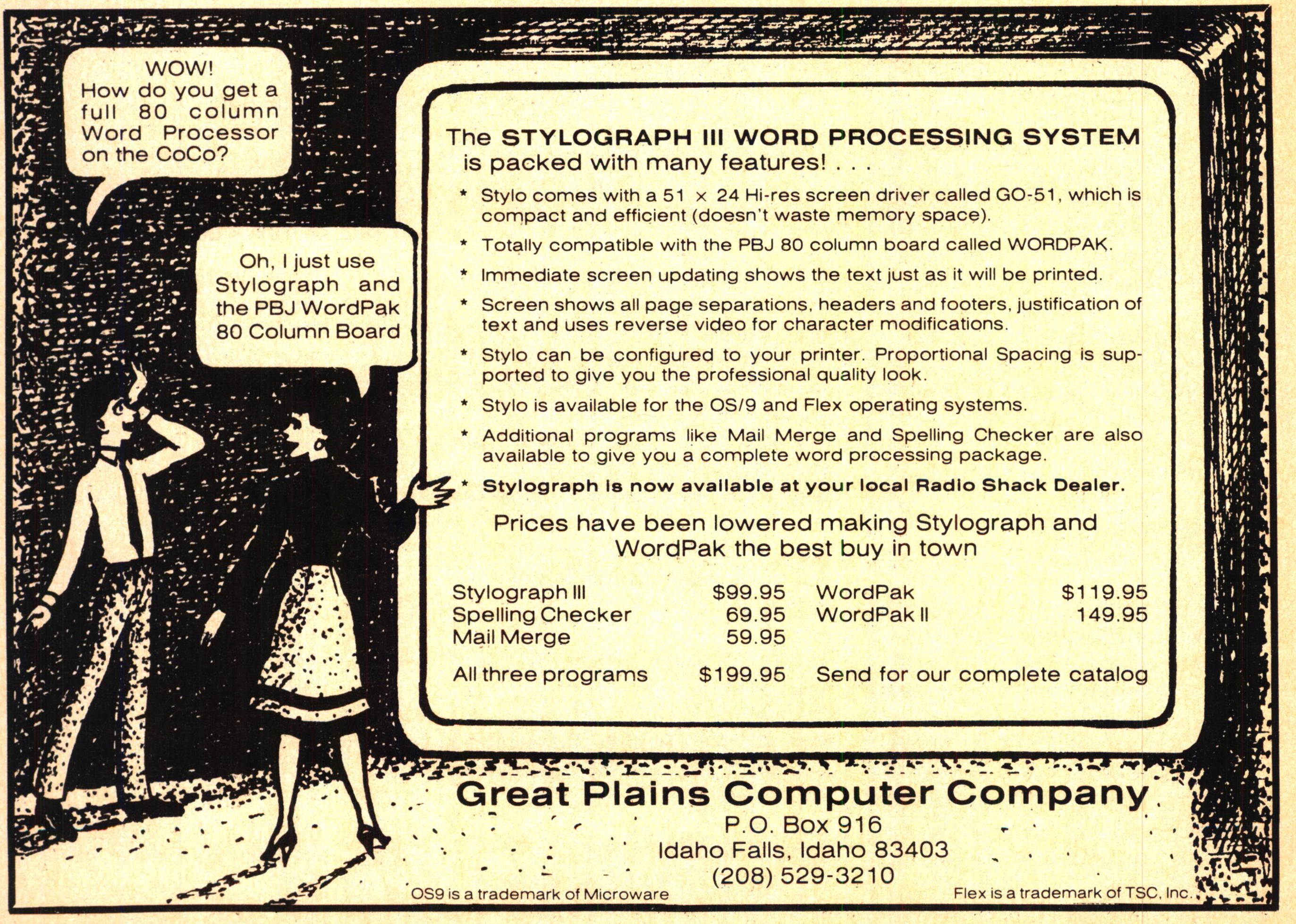
Like the READ and READLN statements, you can use Booleans, integers, reals and strings (as well as enumerated types) in WRITE and WRITELN statements with text files. In fact, when using text files, you can use full expressions as arguments to these statements. For example:

```
WRITE (TextFile, 'THE ANSWER IS ',
R*I);
```

This puts each character of the string 'THE ANSWER IS' to the file Text File and then converts the product of R and I to ASCII and puts each character of the result to the same file. Each argument in a WRITE statement can have an optional field width specification as follows:

```
WRITE (TextFile, 'THE ANSWER IS ':15,
R*I:10);
```

The colon following the argument indicates that you want to specify an


WOW!
How do you get a full 80 column Word Processor on the CoCo?
Oh, I just use Stylograph and the PBJ WordPak 80 Column Board
The **STYLOGRAPH III WORD PROCESSING SYSTEM** is packed with many features! . . .

- * Stylo comes with a 51 × 24 Hi-res screen driver called GO-51, which is compact and efficient (doesn't waste memory space).
- * Totally compatible with the PBJ 80 column board called WORDPAK.
- * Immediate screen updating shows the text just as it will be printed.
- * Screen shows all page separations, headers and footers, justification of text and uses reverse video for character modifications.
- * Stylo can be configured to your printer. Proportional Spacing is supported to give you the professional quality look.
- * Stylo is available for the OS/9 and Flex operating systems.
- * Additional programs like Mail Merge and Spelling Checker are also available to give you a complete word processing package.
- * **Stylograph is now available at your local Radio Shack Dealer.**

Prices have been lowered making Stylograph and WordPak the best buy in town

Stylograph III	$99.95	WordPak	$119.95
Spelling Checker	69.95	WordPak II	149.95
Mail Merge	59.95		
All three programs	$199.95	Send for our complete catalog	

Great Plains Computer Company
P.O. Box 916
Idaho Falls, Idaho 83403
(208) 529-3210

OS9 is a trademark of Microware
Flex is a trademark of TSC, Inc.

explicit field width rather than allowing it to default. In the above example, the string is padded on the right with an extra blank (in standard PASCAL the padding is on the left) and the real expression is printed with more significant digits. The default width is one for characters, a string's actual length, eight for reals and six for everything else. In addition to a width, you can specify a number of fractional digits for real values by adding a second colon and value:

```
WRITE (TextFile, 'THE ANSWER IS':15,
R*1:10:5);
```

In this case, the final real value is printed with a sign, up to three leading digits, a decimal point and five digits to the right of the decimal. If you do not specify the number of fractional digits, scientific notation is used.

Example Program

This month's program manages a Christmas gift list. It lets you create, update and print a list of names, gifts and budgeted amounts. The list is made up of a number of elements of type Member.

The program operates by providing a menu of operations you can perform:

```
XMAS LIST PROGRAM

R —  READ LIST
W —  WRITE LIST
U —  UPDATE LIST
A —  ADD TO LIST
P —  PRINT LIST
Q —  QUIT

ENTER SELECTION:
```

When you select one, the program invokes the corresponding procedure to perform that operation. ReadMembers prompts for a filename and then reads that file into the array MemberData. It uses the GET procedure to actually perform the reading. WriteMembers does the reverse using the PUT procedure to output all the data in MemberData to the specified file. You will notice in both the RESET and REWRITE statements a third parameter. This parameter allows you to specify a default filename extension to use if one is not present in the second parameter.

The UpdateMembers and AddMembers procedures let you make whatever changes you wish to the information in MemberData. MemberCount always contains the number of members of your list and TotalAmount contains the total estimated amount of money you will be spending.

The PrintMembers procedure prints a formatted listing of the list on your printer. The procedure makes extensive use of the formatting capabilities of PASCAL I/O.

If you have any questions about I/O in PASCAL, you can call (301) 253-1300 during normal business hours for help. Next month we will go into detail about block structure and recursion in PASCAL.

The listing:

```
00 0000   (*****************************************************************
00 0000   *
00 0000   *    This program creates, updates and lists a gift giving list
00 0000   *
00 0000   *****************************************************************)
00 0000
00 0000   PROGRAM XmasList (Input, Output);
00 0000
00 0000   CONST  MaxMembers = 30;
00 0000
00 0000   TYPE   Member = RECORD
00 0000                    Name:   String (30);
00 0000                    Gift:   String (30);
00 0000                    Amount: Real;
00 0000                  END;
00 0000
00 0000   VAR    MemberFile : FILE OF Member;
00 0000          MemberData : ARRAY[1..MaxMembers] OF Member;
00 0000          MemberCount: Integer;
00 0000          TotalAmount: Real;
00 0000          Selection  : Char;
00 0000   (*****************************************************************
00 0000   *
00 0000   *    Read in the members from a file
00 0000   *
00 0000   *****************************************************************)
00 0000
00 0000   PROCEDURE ReadMembers;
10 0003
10 0003   VAR FileName : String (20);
10 0003
10 0003   BEGIN
11 000A     WRITELN;
11 0014     WRITE ('INPUT FILE NAME: ');
11 0038     READLN (FileName);
11 004F     RESET (MemberFile, FileName, 'XMS');
11 006A     MemberCount := 0;
11 0072     TotalAmount := 0.0;
11 0086     WHILE NOT EOF (MemberFile) AND (MemberCount < MaxMembers) DO BEGIN
12 00C3       MemberCount := MemberCount + 1;
12 00D2       MemberData[MemberCount] := MemberFile^;
12 00FF       Get (MemberFile);
12 0110       TotalAmount := TotalAmount + MemberData[MemberCount].Amount;
12 0149       END;
11 014C   END;
00 0150   (*****************************************************************
00 0150   *
00 0150   *    Write the members out to a file
00 0150   *
00 0150   *****************************************************************)
00 0150
00 0150   PROCEDURE WriteMembers;
10 0150
10 0150   VAR I : Integer;
10 0150       FileName : String (20);
10 0150
10 0150   BEGIN
11 0157     WRITELN;
11 0161     WRITE ('OUTPUT FILE NAME: ');
11 0186     READLN (FileName);
11 019D     REWRITE (MemberFile, FileName, 'XMS');
11 01B8     FOR I := 1 TO MemberCount DO BEGIN
12 01CE       MemberFile^ := MemberData[I];
12 01F9       Put (MemberFile);
12 020A       END;
11 0215     Close (MemberFile);
11 0226   END;
00 022A   (*****************************************************************
00 022A   *
00 022A   *    Update the members on the list
00 022A   *
00 022A   *****************************************************************)
00 022A
00 022A   PROCEDURE UpdateMembers;
10 022A
10 022A   VAR Current,I : Integer;
10 022A       Answer:     String (1);
10 022A       NewGift:    String (30);
10 022A
10 022A   BEGIN
11 0231     Current := 1;
11 0236     WHILE Current <= MemberCount DO BEGIN
12 0247       WRITELN ('NAME: ', MemberData[Current].Name);
12 027F       WRITELN ('GIFT: ', MemberData[Current].Gift);
12 02B9       WRITELN ('AMOUNT: ', MemberData[Current].Amount:9:2);
12 02FE       WRITELN;
```

RAINBOWfest
SM

Irvine

Feb. 15-17

Show Schedule:

Friday evening — Exhibit hall open from 7 p.m. to 10 p.m.
Saturday — Breakfast at 8 a.m. Exhibit Hall opens at 10 a.m. and closes at 6 p.m.
Sunday — Exhibit Hall open from 11 a.m. to 4 p.m.

Joining in the fun and excitement of **RAINBOWfest** is a great way to get to know the CoCo Community. Many of those who write for THE RAINBOW —and those who are written about — attend CoCo's very own show. It's a people-to-people event as well as a valuable learning experience.

For the 1984-85 season, we've scheduled three **RAINBOWfests** in three parts of the country. If you missed the **RAINBOWfest** in Princeton, N.J., why don't you make plans now to be with us in Irvine, Calif., or Chicago, Ill.? Each show will offer fun, excitement, new products, seminars and information for your CoCo! And for those who (perish the thought) don't like CoCo as much as you, we've scheduled each **RAINBOWfest** in an area that will provide fun and enjoyment for the whole family.

Our Irvine, California, show is being held at the Irvine Marriott Hotel, which offers special rates for **RAINBOWfest**. The show opens Friday evening with a 7 p.m. to 10 p.m. session. It's a daytime-only show Saturday — the CoCo Community Breakfast is at 8 a.m., then the exhibit hall opens promptly at 10 a.m. and runs continuously until 6 p.m. There will be no exhibition hours or seminars Saturday evening. On Sunday, the exhibit hall opens at 11 a.m. and closes at 4 p.m.

Our highly popular CoCo Community Breakfast will again feature a well-known figure from the Color Computer Community. And the exhibition will be interspaced with a number of seminar sessions on all aspects of CoCo — from writing in machine language to making your BASIC work better.

But most of all, there will be exhibitors. Lots of them. All ready to demonstrate products of every kind. Some with special programs and hardware items to introduce. Others with show specials.

Tickets can be secured directly from THE RAINBOW. We'll also send you a special reservation form so you can get your special room rate.

Come to **RAINBOWfest** . . . help us all celebrate CoCo Community at its finest.

United Airlines and THE RAINBOW have joined together to offer a special discounted fare to those attending **RAINBOWfest**-Irvine. Simply by calling United at the toll free number listed below and identifying our meeting, with account number 522-I, you will be eligible for a 20 percent discount on the Easy Saver Fare. The only requirement is a Saturday night stay.

(800) 521-4041
Account Number 522-I

RAINBOWfest-Irvine, California (L.A. area)
Date: February 15-17, 1985
Hotel: Irvine Marriott Hotel
Rooms: $65 per night, single or double
Advance Ticket Deadline: February 8, 1985

RAINBOWfest-Chicago, Illinois
Date: May 17-19, 1985
Hotel: Hyatt Regency Woodfield
Rooms: $49 per night, single or double
Advance Ticket Deadline: May 10, 1985

RAINBOWfest Irvine

Seminar Program And Speakers

• Linda Nielsen — **The CoCo Artist**
High Res Graphics

Linda, of Moreton Bay Laboratory, and several others active in the CoCo area, will demonstrate some graphics and help you to learn about some techniques you can use.

• Dale Puckett — **Beginner's Tour Of OS-9**
Beginner's Tour Of BASIC09

A free-lance writer and programmer, Dale has worked with microprocessors since 1976, and is the author of *The Official BASIC09 Tour Guide*. Dale will be available to sign copies of his new book, *The Complete RAINBOW Guide to OS-9.*

• Bob Albrecht — **School Is In The Heart Of The Child**

Bob Albrecht, RAINBOW columnist who writes "School Is In The Heart Of The Child," is one of the most prolific authors in the microcomputer world today. A specialist in writing for beginners, he is the author of numerous books, including *TRS-80 Color BASIC.*

• Jim Reed — **Writing For RAINBOW**

Jim, managing editor of THE RAINBOW, will talk about how you can submit programs and articles to magazines for fun and profit. He is also senior editor of PCM — and editorial director of SOFT SECTOR (for the Sanyo).

• Dan Downard — **Inside Your Color Computer**
Software And Hardware Interfacing

Dan Downard is the technical editor for THE RAINBOW and an electrical engineer. He has been involved in electronics for 24 years through ham radio (K4KWT). His interest in computers began about five years ago and he has built several 68XX systems.

• Don Inman
• Tim Finger
• Bob Albrecht
Along with several other panelists

A Realizable Fantasy:
The Home Dream Machine

Don Inman is a co-author of a series of booklets for Radio Shack titled *Color LOGO Guide for Teachers*. He is a former teacher and is presently a full-time author with the DYMAX group.

Tim Finger is a member of the DYMAX group, along with Don and Bob.

• Bill Nolan
• Bob Albrecht

GameMaster's Apprentice And
Dragon's Byte

Bill Nolan, who teaches "Programming In BASIC" at the college level, owns Prickly-Pear Software Co. and has written several commercially successful software packages.

FREE Rainbow poster
for first 500 tickets ordered.

FREE T-Shirt to first five people
from each state who buy tickets.

Make checks payable to:
THE RAINBOW

MAIL TO:

RAINBOWfest
P.O. BOX 385
Prospect, KY 40059
(502) 228-4492

YES, I'm coming to *RAINBOWfest*! I want to save by buying tickets now at the special advance sale price. Send me tickets for (check one):

☐ Irvine, California ☐ Chicago, Illinois

Please send me:

_______ three day tickets at $9 each total _______
_______ one day tickets at $7 each total _______
Circle one: Friday / Saturday / Sunday
_______ Saturday breakfast tickets at $12 each total _______
Handling Charge $1 1.00
TOTAL ENCLOSED (U.S. FUNDS ONLY, PLEASE) $ _______

☐ Also send me a hotel reservation card for ( ) Irvine, or ( ) Chicago.

NAME *(please print)* _______
STREET & NUMBER _______
CITY & STATE _______
TELEPHONE _______ ZIP CODE _______
COMPANY _______

Orders received less than two weeks prior to show opening will be held for you at the door.

VISA, MasterCharge, American Express accepted.

My Account # _______ Ex. Date: _______
Signature _______

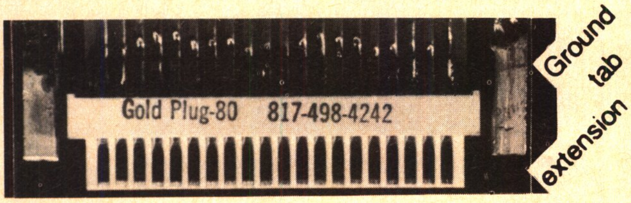
```
12 0308       WRITE ('DELETE? (N) ');
12 0327       READLN (Answer);
12 033D
12 033D       IF (Answer = 'Y') OR (Answer = 'y') THEN BEGIN
13 0367         MemberCount := MemberCount - 1;
13 037E         TotalAmount := TotalAmount - MemberData[Current].Amount;
13 03B1         FOR I := Current TO MemberCount DO
13 03C6           MemberData[I] := MemberData[I+1];
13 0412         END
12 0412
12 0412       ELSE BEGIN
13 0415         WRITE ('GIFT: ');
13 042E         READLN (NewGift);
13 0445         IF NewGift <> '' THEN BEGIN
14 0454           MemberData[Current].Gift := NewGift;
14 0477           TotalAmount := TotalAmount - MemberData[Current].Amount;
14 04AC           WRITE ('AMOUNT: ');
14 04C7           READLN (MemberData[Current].Amount);
14 04ED           TotalAmount := TotalAmount + MemberData[Current].Amount;
14 0522           WRITELN;
14 052C           END;
13 052C         Current := Current + 1;
13 0537         END;
12 0537       END;
11 053A   END;

00 053E   (***************************************************************
00 053E   *
00 053E   *    Add new members to the list
00 053E   *
00 053E   ***************************************************************)
00 053E
00 053E   PROCEDURE AddMembers;
10 053E
10 053E   VAR NewName : String (30);
10 053E
10 053E   BEGIN
11 0545     WHILE MemberCount < MaxMembers DO BEGIN
12 0557       WRITE ('NEW NAME: ');
12 0572       READLN (NewName);
12 0589       IF NewName = '' THEN EXIT;
12 059C       MemberCount := MemberCount + 1;
12 05AD       MemberData[MemberCount].Name := NewName;
12 05D2       WRITE ('GIFT: ');
12 05EB       READLN (MemberData[MemberCount].Gift);
12 061A       WRITE ('AMOUNT: ');
12 0635       READLN (MemberData[MemberCount].Amount);
12 065F       TotalAmount := TotalAmount + MemberData[MemberCount].Amount;
12 069B       WRITELN;
12 06A2       END;
11 06A5   END;

00 06A9   (***************************************************************
00 06A9   *
00 06A9   *    Print the members of the list
00 06A9   *
00 06A9   ***************************************************************)
00 06A9
00 06A9   PROCEDURE PrintMembers;
10 06A9
10 06A9   VAR I       : Integer;
10 06A9      Printer : Text;
10 06A9
10 06A9   BEGIN
11 06B1     REWRITE (Printer, ':-2');
11 06C7     Page (Printer);
11 06D6     WRITELN (Printer, 'NAME':32, 'GIFT':32, '    AMOUNT');
11 0711     FOR I := 1 TO 74 DO WRITE (Printer, '-');
11 0744     WRITELN (Printer);
11 074D     FOR I := 1 TO MemberCount DO
11 0763       WRITELN (Printer, MemberData[I].Name:32, MemberData[I].Gift:32,
11 07AB                        MemberData[I].Amount:10:2);
11 07E3     FOR I := 1 TO 74 DO WRITE (Printer, '-');
11 0816     WRITELN (Printer);
11 081F     WRITELN (Printer, 'TOTAL':64, TotalAmount:10:2);
11 0850   END;
00 0854   (***************************************************************
00 0854   *
00 0854   *    Main Entry to XmasList
00 0854   *
00 0854   ***************************************************************)
00 0854
00 0854   BEGIN
01 085C     Page;
01 0868     TotalAmount := 0.0;
01 087C     MemberCount := 0;
01 0882
01 0882     WHILE True DO BEGIN
02 088A       WRITELN;
02 0892       WRITELN ('XMAS LIST PROGRAM');
02 08B5       WRITELN;
02 08BD       WRITELN (' R - READ LIST');
02 08DD       WRITELN (' W - WRITE LIST');
02 08FE       WRITELN (' U - UPDATE LIST');
02 0920       WRITELN (' A - ADD TO LIST');
02 0942       WRITELN (' P - PRINT LIST');
02 0963       WRITELN (' Q - QUIT');
02 097E       WRITELN;
02 0986       WRITE ('ENTER SELECTION: ');
02 09A8       READLN (Selection);
02 09B9
02 09B9       CASE Selection OF
02 09BD         'R' : ReadMembers;
02 09D0         'W' : WriteMembers;
02 09E2         'U' : UpdateMembers;
02 09F4         'A' : AddMembers;
02 0A06         'P' : PrintMembers;
02 0A18         'Q' : EXIT
02 0A24         ELSE WRITELN ('INVALID SELECTION')
02 0A47         END;
02 0A4A
02 0A4A       WRITELN (MemberCount:10, ' MEMBERS ON LIST');
02 0A7A       WRITELN (TotalAmount:10:2, ' DOLLARS BUDGETED');
02 0AB3       END;
01 0AB6   END.
```

TRS-80+ MOD I, III, COCO, TI99/4a
TIMEX 1000, OSBORNE, others

RAINBOW CERTIFICATION SEAL

GOLD PLUG - 80

Eliminate disk reboots and data loss due to oxidized contacts at the card edge connectors. **GOLD PLUG 80** solders to the board edge connector. Use your existing cables. (if gold plated)



COCO Disk Module (2) $16.95
Ground tab extensions INCL
Disk Drives (all R.S.) $7.95
Gold Disk Cable 2 Drive 29.95
Four Drive Cable 39.95

new SPECIAL PRICE

USA shipping $1.45 Can/Mex $4.
Foreign $7 Don't wait any longer TEXAS 5% TAX

Available at your favorite dealer or order direct from

MasterCard

E.A.P. CO.
P.O. BOX 14
KELLER, TEXAS 76248
(817) 498-4242

VISA

MC/VISA

+ trademark Tandy Corp

OS-9 SOFTWARE WITH X-TRA POWER

XTERM

XTERM is a full featured OS-9 communications program that takes full advantage of the power of OS-9. It works with the normal text screen, XSCREEN, or the Wordpak 80 column board.

XTERM is menu oriented for ease of use, it is simple to use even for the novice OS-9 user. And yet, XTERM is powerful enough for the expert OS-9 user.

Some of the features of XTERM include: full upload and download support with remote buffer operation; supports XON/XOFF protocol; 110/300/600/1200 baud, 5/6/7/8 bits, even/odd/no parity, full or half duplex; able to execute an OS-9 shell command from within XTERM.

XTERM works with a Color Computer using the standard serial interface, but also will work with a hardware serial port. Also, if you are using a hardware parallel printer port, you can print data to the printer as it is received.

XTERM $59.95

XSCREEN

XSCREEN creates a high resolution screen for the Color Computer using OS-9. This high resolution screen gives you 24 lines of text with 51, 64, or 85 characters per line. Characters can be either white on a black background or vice versa.

XSCREEN is very easy to use because it is menu operated. No codes to memorize or manuals to consult when you want to change character size, just go to the menu.

XSCREEN $19.95

XWORD

XWORD is a powerful word processing system for the Color Computer using OS-9. XWORD is feature packed with only a few features mentioned here.

Some of the editing features of XWORD include: true character oriented full screen editor; works with the normal text screen, XSCREEN, O-PAK, or WORDPAK 80 column card; full block commands with blocks displayed in inverse characters (except with normal text screen) for easy block manipulation; file size not limited to a buffer size; full find and replace commands with wildcard character; able to execute an OS-9 shell command in the middle of editing. Many, many more features, too many to mention here.

Some of the formatting features of XWORD include: proportional spacing supported; perfectly aligned hanging indents and columns, even when using proportional characters; full printer control with control of character size, emphasized, italics, overstrike, underlining (with or without spaces), super and sub-scripts; up to 10 header/footers; page numbering in decimal or Roman numerals; margins and headers can be set differently for even and odd pages; automatically reads printer initialization file to define XWORD for your printer (many included, and easy to write or modify your own). Many more features.

XWORD $79.95

XED

XED is the editor portion of XWORD. XED includes all of the editing features listed under XWORD above. XED is for people who need a full featured screen editor but do not need all of the formatting power of a word processor.

XED $49.95

MICROTECH CONSULTANTS INC.
1906 Jerrold Avenue
St. Paul, MN 55112
Dealer Inquiries Invited

Ordering Information

MasterCard VISA

Add $2.50 shipping & handling. MN residents add 6% sales tax. Visa, Mastercard, COD (add $2.50), personal checks: all shipped from stock within 24 hours.

(612) 633-6161

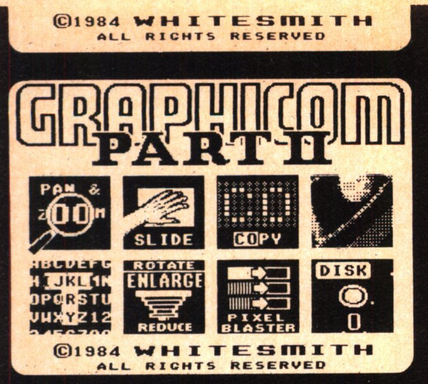
THESE FINE STORES CARRY THE RAINBOW

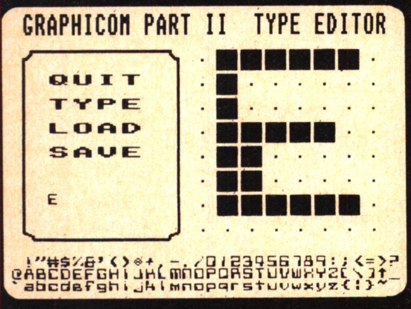
The retail stores listed below carry THE RAINBOW on a regular basis and may have other products of interest to Color Computer users. We suggest you patronize those in your area.

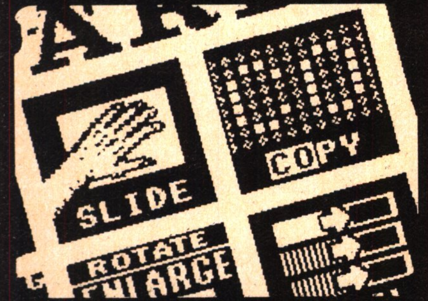
ALABAMA	
Birmingham	Jefferson News Co.
Florence	Anderson News Co.
Huntsville	Endicott Software
Madison	Madison Books
Montgomery	Trade 'N' Books
ALASKA	
Fairbanks	Electronic World
ARIZONA	
Mesa	Personal Computer Place
Phoenix	Home Brew Computers
	The Computer Shop
	Tri-Teck Computers
Scottsdale	Data Concepts
	Softwareland Corp.
Tempe	All Systems Go
	Books Etc.
	Computer Library
Tucson	Anderson News Co.
	Minz Electronics
Yuma	Soft Shop
ARKANSAS	
Little Rock	Anderson News Co.
CALIFORNIA	
Citrus Heights	Software Plus
Downey	The Floppi Disk
El Cajon	Radio Shack
Exton	Software City
Folsom	Computers, Etc.
Fortuna	R&V Sound
Gretna	The Computer Supply Store
Half Moon Bay	Strawflower Electronics
Hesperia	Dessert Sound, Inc.
Hollywood	Levity Distributors
Livermore	Software Galeria
Lompoc	L&H Electronics Emporium
Los Angeles	Polygon Co.
Milpitas	AVS Computer Systems
Modesto	Software Mart
National City	JARB Software
	Willy's Electronics
Pacific Beach	Pro Am Electronics
Palo Alto	Printers, Inc.
Sacramento	Tower Magazine
San Diego	Computer Dimension
	The Computer Store
	Cost Plus Software
	Dimensional Software
	Disney's Electronics
	Radio Shack
San Francisco	News On 24
Santa Rosa	Sawyer's News, Inc.
	Software 1st
Southgate	Color Computing
Stockton	Hardings Way News
Sunnyvale	Computer Literacy
COLORADO	
Aurora	Aurora Newsland
Colorado Springs	Hathaway's Magazines
Westminster	Software City
CONNECTICUT	
Danbury	Computer Serv. of Danbury
Monroe	Mackey's
Orange	Software City
DELAWARE	
Wilmington	Normar, Inc.—The Smoke Shop
DISTRICT OF COLUMBIA	
	The Program Store
FLORIDA	
Boca Raton	Software, Software, Inc.
Clearwater	The Avid Reader
	Soenen & Wilmoth Books
	Software City
Cocoa	Village Book Shop
Coconut Creek	Data Base
Davie	Software Plus More
Ft. Lauderdale	Mike's Electronics Distributor
	Software Connection
Jacksonville	The Book Nook
	Book Town
Kissimmee	Radio Shack & Elec. Hut
Longwood	Adventure International Store
Melbourne	City Newsstand
	The Little Store
Miami	Micro Byte
	The News Rack
Orange Park	Software City
Orlando	The Alamo
	Software Unlimited
Panama City	Computer Systems Group
	Boyd-Ebert Corp.
Pensacola	Anderson News Co.
Sarasota	Family Computers
South Pasadena	Poling Place
Stuart	Caribbean Engineering Corp.
Tallahassee	Anderson News Co.
Tampa	Fine Print Bookstore
	Software City
	Software Store
	Sound Trader & Computer Center
GEORGIA	
Atlanta	Chips, Inc.
	Guild News Agency
	Software City
Augusta	Software City
Columbus	Muscogee News Co.
	Software City
Cummings	Kent Radio Shack
Jesup	Kannon Music
	Radio Shack
Marietta	Act One Video
St. Simons Island	Radio Shack
Toccoa	Martin Music Radio Shack
IDAHO	
Blackfoot	F/M Systems Electronics
Boise	Magnum Computer Products
Moscow	Johnson News Agency
ILLINOIS	
Aurora	Kroch's & Brentano's
Champaign	Book Market
Chicago	B. Dalton Booksellers
	N. Walbash St.
	West Jackson St.
	Bob's in Newtown
	Bob's News Emporium
	Bob's Rogers Park
	Book Market
	East Cedar
	North Cicero
	West Diversey
	E.B. Garcia & Associates
	Guild Books & Periodicals
	Kroch's & Brentano's
	South Walbash
	West Jackson
	516 N. Michigan
	835 N. Michigan
	Parkway Drugs
	Parkwest Books
	Sandmeyer's Bookstore
	Univ. of Chicago Bookstore
	Univ. of Illinois Bookstore
	Videomat, Inc.
Chillicothe	Book Emporium
Danville	Book Market
Decatur	Book Emporium
	K-Mart Plaza
	Northgate Mall
DeKalb	Appletree Computers
East Moline	Book Emporium
Evanston	Chicago-Main News
Geneseo	B & J Supply
Kewanee	Book Emporium
Lisle	Book Nook
Newton	Bill's TV Radio Shack
Oak Brook	Kroch's & Brentano's
Oak Park	B.I.E.S. Systems
	Kroch's & Brentano's
Paris	Book Emporium
Peoria	Book Emporium
	Sheridan Village
	Westlake Shopping Center
	Book Market
	Illinois News Service
Schaumberg	Kroch's & Brentano's
Skokie	Kroch's & Brentano's
Springfield	Book Emporium
	Sangamon Center North
	Town & Country Shopping Ctr.
Sunnyland	Book Emporium
West Frankfort	Paper Place
Wheeling	North Shore Distributors
INDIANA	
Berne	White Cottage Electronics
Garrett	Finn News Agency, Inc.
Greenwood	The Computer Experience
Indianapolis	Bookland, Inc.
	Indiana News
Jasper	Computer Store
	Elex Mart
Lawrenceburg	Bauer Electronics
Madison	Arcs Office Supplies
Marion	Computer Corner
Martinsville	Radio Shack
New Haven	Advanced Color Software
Scottsburg	Radio Shack of Scottsburg
Walbash	Mitting's Electronics
IOWA	
Bettendorf	Cosmos Computers
Davenport	Interstate Book Store
	Software City
KANSAS	
Junction City	Ill H's Stereo
Topeka	Palmer News, Inc.
	Town Crier of Topeka, Inc.
Wichita	Amateur Radio Equipment Co.
	Lloyd's Radio
KENTUCKY	
Hopkinsville	Hobby Shop
Louisville	The Computer Store
Maysville	Radio Shack
Paducah	Radio Shack
Paintsville	Gus-Stan Enterprises
Pikeville	Gus-Stan Enterprises
LOUISIANA	
Baton Rouge	Acme Book Co.
	Software Solutions
Crowley	Acadiana Newsstand
Shreveport	Computer SOS
Slidell	Radio Shack 7181
MAINE	
Brockton	Voyager Bookstore
E. Wilton	O'brian's Electronic Svc. Ctr.
Lewiston	Computer Software & Education Centers
South Portland	Portland News Co.
Waterboro	Radio Shack
MARYLAND	
Baltimore	The Program Store
Kensington	The Program Store
Lexington Park	Books, Etc.
	Bowes Books
MASSACHUSETTS	
Brockton	Vogager Bookstore
Cambridge	Ninis Corner, Inc.
	Out Of Town News
	The Program Store
Danvers	Microcon Computer & Software Store
Farmingham	Program Store
Fitchburg	Corners Book Shop
Ipswich	Ipswich News
Littleton	Computer Plus
Lynn	North Shore News Co.
Woburn	Microcon Softwarecenters
MICHIGAN	
Allen Park	Book Nook, Inc.
Ann Arbor	Community News Center
Brooklyn	Weatherwax Radio Shack
Charlotte	Computer Options
Dearborn	DSL Computer Products
Durand	Robbins Electronics
Fenton	Tri-County Electronics Radio Shack
Flint	"I O"
Greenville	Robbins Electronics
Kalamazoo	John Rollins
Lapeer	Computer Corner
	User Friendly
Lowell	Curt's Sound & Home Arcade Center
Mt. Clemens	Key Book Shop
	Michigan Radio
Mt. Morris	Shop And Save
Muskegon	The Eight Bit Corner
Novi	MI Software Dist., Inc.
Okemos	Software City
Owosso	C/C Computer Systems
	Hi-Fi Audio Co.
Perry	Perry Computers
	Perry Oil & Gas
Pontiac	Computer Shack
Roseville	New Horizons
Royal Oak	Software City
St. Johns	Clinton Electronics

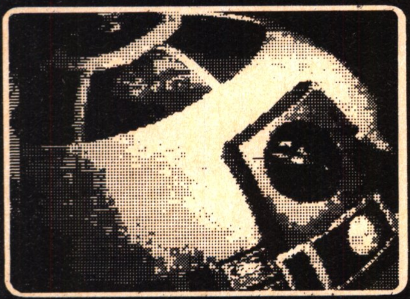
Southfield	Software City
Sterling Heights	Sterling Book Center
Wyoming	Gerry's Book Co.
MINNESOTA	
Minneapolis	Read-More News
MISSISSIPPI	
Grenada	Stereo Store of Grenada, Inc.
Gulfport	Computerland
MISSOURI	
Kansas City	Midwest CoCo Systems
St. Louis	Book Emporium
	Softwaire Centre
	Computer Xchange
University City	Final Edition
NEBRASKA	
Lincoln	Hobby Town
Omaha	Computers & Components
NEVADA	
Las Vegas	Hurley Electronics
	Software City
NEW HAMPSHIRE	
Peterborough	Radio Shack
Portsmouth	Portsmouth Computers
West Lebanon	Verham News Corp.
NEW JERSEY	
Bergenfield	Software City
Cedar Knolls	Village Computer & Software
Cherry Hill	Software City
Clinton	Micro World II
Eatontown	The Program Store
Lawrenceville	Micro Con Software Center
Linwood	Software City
Marmora	Outpost Radio Shack
Montvale	Software City
Morristown	Software City
Pennsville	Dave's Elect. Radio Shack
River Edge	Software City
Rockaway	Software Station
Summit	Software City
Teaneck	Software City
Wayne	Wayne Software
NEW MEXICO	
Albuquerque	East West Enterprises
	Page One Newsstand
	Salt of the Earth
Los Alamos	Sound Center — Radio Shack
NEW YORK	
Brockport	Lift Bridge Book Shop, Inc.
East Syracuse	The Data'Phile Co.
Elmira Heights	Southern Tier News Co., Inc.
Fairport	Software City
Hudson Falls	G.A. West & Co.
Johnson City	Unicorn Electronics
Mt. Kisco	Software City
New York	Barnes & Noble—Sales Annex
	Coliseum Books
	Eastern Newsstand
	Grand Central Station, Track 37
	200 Park Ave., (Pan Am #1)
	55 Water Street
	World Trade Center #2
	First Stop News
	Idle Hours Bookstore
	International Smoke Shop
	Jonil Smoke
	Penn Book
	State News
	Usercom Systems, Inc.
	Walden Books
	World Wide Media Services
N. White Plains	Software City
Plattsburg	Adirondack Computer Supplies
Rochester	Village Green
	World Wide News
Spring Valley	Software City
Syracuse	Programs Plus
Woodhaven	Spectrum Projects
NORTH CAROLINA	
Aberdeen	King Electronics
	Radio Shack
Charlotte	Software City
	Newsstand Int'l
	Papers & Paperback
Havlock	Computer Concerns
Hickory	C² Books & Comics
Marion	Boomers Rhythm Center
Raleigh	D.J.'s Book and News
	Softmart
Winston-Salem	K & S News Stand
NORTH DAKOTA	
Fargo	Computer Associates
OHIO	
Canton	Little Professor Book Center
Cincinnati	Cinsoft
Columbus	The Program Store
Coshocton	Utopia Software
Dayton	Wilke News
Fairborn	News-Readers
Kent	The News Shop
Kenton	T.W. Hogan & Associates
Lakewood	Lakewood International News
Lima	Brunner News Agency
	Edu-Caterers
Mayfield Heights	Programs Unlimited
	Software City
Miamisburg	Wilke News
Rocky River	Programs Unlimited
Toledo	Leo's Book & Wine Shop
	Reitz Electronics
Westerville	Home Computer Store
Youngstown	Software City
OKLAHOMA	
Hobart	Shortgrass Electronics
Oklahoma City	Merit Micro Software
OREGON	
Aloha	B. Color Computer and Software
Hermiston	Lee's TV & Radio Clinic
Medford	John's News Stand
Portland	80-Plus
PENNSYLVANIA	
Allison Park	Software City
Altoona	Newborn Enterprises
Greensburg	The Program Store
Harrisburg	Harrisburg News Co.
Huntingdon Valley	Software City
Malvern	Personal Software
Philadelphia	City Software Center
	Newsy
Phoenixville	Stevens Radio Shack
Pittsburgh	All-Pro Souveniers
Pleasant Hills	Pitt Computer & Software
Plymouth Meeting	The Program Store
Pottstown	Video Programming, Inc.
Scranton	Quinn Computer Supply
Shippensburg	Rainbow Adventure
Tunkhannock	The Donna Comm. Co.
Whitehall	Software City
Williamsport	Shade Tree
York	The Computer Center of York
RHODE ISLAND	
Newport	Kelly's Variety
Warwick	Software Connection
SOUTH CAROLINA	
Charleston Hts.	Software Haus, Inc.
Beaufort	Data Byte Computer Center
Greenville	Palmetto News Co.
Hilton Head	Megatron Corporation
Spartanburg	Software City
Union	Fleming's Electronics
TENNESSEE	
Chattanooga	Anderson News Co.
Dickson	Highland Electronics
Knoxville	Anderson News Co.
	First Byte Computer Co.
Memphis	Computer Center
	Software, Inc.
	Tobacco Corner Newsroom
Nashville	Campus Computer Corp.
	Mosko's Book Store
Smyrna	Delker Electronics
TEXAS	
Austin	Austin News Agency, Inc.
	Capitol Microcomputers
Beeville	Bee Electronics
Conroe	Crouchet Electronics
Elgin	The Homing Pigeon
Ft. Worth	RFI Electronics
	Software Terminal
Houston	MicroSolutions
Irving	Software Access
Orange	Northway Books & News
Paris	Software Solutions
UTAH	
Murray	Deseret Book
Ogden	Computer City
VIRGINIA	
Alexandria	Alonso Book & Periodical
Falls Church	The Program Store
Gafton	Electronics Marketing
Norfolk	I-O Computers
Richmond	Software City
WASHINGTON	
Bellevue	Software City
Marysville	More Than Games
Mount Lake Terrace	Emerald Computer Services
Renton	Data Borne
Seattle	Adams News Co., Inc.
Tacoma	Nybbles 'N Bytes
WEST VIRGINIA	
Lesage	Pioneer Technology
Logan	Stan's Electronics & Radio Shack
Parkersburg	Valley News Service
WISCONSIN	
Appleton	Badger Periodicals
Cudahy	Cudahy News & Hobby
Janesville	Book World
Ladysmith	Electronics, Etc.
Milwaukee	Abacus Micro
	Book Tree
	Booked Solid
	Booked Solid II
	Harvey Schwartz Bookshop
	Univ. of Wisconsin Bookshop
WYOMING	
Casper	The Computer Store
AUSTRALIA:	
SYDNEY	
Kingsford	Paris Radio Electronics
CANADA:	
ALBERTA	
Athabasca	McLeans Ltd.
Banff	Banff Radio Shack
Barrhead	Barrhead Sound 1982 Ltd.
Blairmore	L & K Sports & Music
Brooks	Double "D" A.S.C. Radio Shack
Calgary	Billy's News
	Imperial Computer Ltd.
Camrose	Radio Shack Associated Stores
Claresholm	Radio Shack Associated Stores
Coaldale	Coaldale Sight & Sound
Drayton Valley	Langard Electronics
Edmonton	CMD Micro
	Kelly Software Distributors
Edson	Radio Shack
Fairview	D.N.R. Furniture & TV
Fox Creek	Fox City Color & Sound
Ft. Macleod	Fort Pharmacy
	Radio Shack
Grande Cache	The Stereo Hut
Grande Centre	The Book Nook
Grande Prairie	Northern Computer Service
Hanna	Technics TV Ltd.
Innisfail	L & S Stereo
Lacombe	Tall Pine TV
Leduc	Radio Shack Associated Stores
Lloydminster	Lloyd Radio Shack
Peace River	H & S Music Centre
	Radio Shack Associated Stores
Pincher Creek	Thornton & Son's
Redcliff	Gale Distributing
Red Deer	Computer World
Rimbey	Roy's TV
St. Paul	Tele-Logic
Sundre	Sundre Sound
Taber	Pynewood Sight & Sound
Valleyview	Don's Radio Shop
Vermillon	Photocraft Vermilion Ltd.
Wetaskiwin	Radio Shack
BRITISH COLUMBIA	
Burnaby	Compulit
Campbell River	TRS Electronics
Chilliwack	Charles Parker
Courtenay	Valley Computers
Bell Radio & TV	
Ft. St. John	Ken Dawson
Merrit	Merrit Radio Shack
N. Vancouver	Microwest Distributors
Sicamous	Shuswap Electronics
Sidney	Sidney Electronics
Victoria	Datafact
	International Software
	Techworld
Williams Lake	Norcom Software
MANITOBA	
The Pas	Jodi's Sight & Sound
Winnipeg	J & J Electronics Ltd.
NEW BRUNSWICK	
Moncton	Canadian Colour Connection
NEWFOUNDLAND	
Labrador City	Sound & Vision
NOVA SCOTIA	
Dartmouth	Sector Software
Halifax	Atlantic News
ONTARIO	
Angus	Micro Computer Service
Atikokam	Gill's Furniture
Bowmanville	Bowmanville Audio Vision LTD
Cochrane	Frederickhouse Sound
Etobicoke	NEPCOM
Hamilton	Galls Book World
Hanover	CMUG
Kingston	T.M. Computers
London	Multi-Mag
Ottawa	National News Co., Ltd.
South River	Max TV
Strathroy	Downtown Sound
QUEBEC	
LaSalle	Messageries de Presse Benjamin Enr.
Sherbrooke	Soc. De Loc
SASKATCHEWAN	
Assiniboia	Telstar News
Nipiwan	Cornerstone Sound
Regina	George Glass
	Regina CoCo Club
	Softwre Supermarket
Saskatoon	Computertime
Tisdale	Paul's Service
YUKON	
Whitehorse	Big Byte Computer Services
	H & O Holdings
PUERTO RICO	
San Juan	Software City

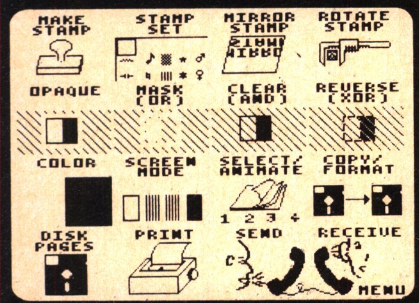
Also available at all Waldenbooks, Coles and selected B. Dalton Bookseller stores in the United States and Canada.











YOU CAN FIND ALMOST ANYTHING UNDER THE RAINBOW!

CALL OR WRITE FOR YOUR
FREE SAMPLE DIGITIZED

Computize INC.

GRAPHICOM $24.95

Simply stated · The finest graphics program written for the Color Computer!

- U-S-E-R F-R-I-E-N-D-L-Y !
- 4 Display modes (Including Hi-Res red/blue artifact)
- Animate mode
- Color Palette with over 15 color patterns for use with Hi-Res artifact
- Send/Receive pictures over standard modem at 300, 600, or 1200 baud
- Supplied utility allows capturing Hi-Res screens from most COCO arcade games (even protected ones)
- Multiple Hi-Res character fonts (user re-definable)
- Supplied utility for transferring Graphicom screens to Basic or other M/L programs.
- Supplied utility for loading screens from Basic or other sources
- Built in Hi-Res SCREEN PRINT (compatible with EPSON, C-ITOH, GEMINI-10, OKI, plus Radio Shack's LP-VII, LP-VIII, DMP-100, DMP-200, and GCP-115 printers) from 110 to 9600 baud
- Slow-scan television SEND/RECEIVE options
- Many additional features, operating hints, hardware mod's and suggestions, etc.

★ EASY TO LEARN GRAPHIC MENU ★
REQUIRES 64K COCO, 1 DRIVE SYSTEM, AND 2 ANALOG JOYSTICKS

G.C.U. GRAPHICOM UTILITY $19.95

- **MULTI DRIVE** · Copy pictures from one disk to another.
- **KILL** · Blank out individual pictures on a pix disk.
- **TRANSFER** · Copy pictures between Graphicom and binary formats.
- **DISPLAY** · View individual pictures.

GRAPHICOM PART II introductory price $24.95

Graphicom Part II is a video processing package that provides many functions that are missing in Graphicom. Here are just a few of the features provided by Graphicom Part II:

ENLARGE/REDUCE/ROTATE
Enlarge or reduce any portion of a screen by any amount, just like a photographic enlarger! Independent of the enlargement or reduction, rotate by any degree or fraction of a degree about any point on the screen.

PAN & ZOOM
"Zoom in" x2, x4, or x8 on any portion of the screen to do fine pixel work. Allows editing of Graphicom character sets with ease!

TYPESETTER & FONT EDITOR
Add text in 16 different sizes with several display modes to chose from including COLORED FOREGROUND & BACKGROUND text! Edit 8x8 characters for use in the typesetter. Over 30 character sets supplied on disk. "GRAB" function allows transfer of some Graphicom character sets to Graphicom Part II format.

PIXEL BLASTER
Allows the user to easily substitute or remove colors. Widen lines, swap BLUE & RED without effecting BLACK & WHITE, etc.

GRAPHICOM PART II DOES NOT REQUIRE GRAPHICOM TO RUN!
Graphicom Part II requires a 64K extended disk basic system, it will load and save both standard BIN files and Graphicom screens, and supports 1 to 4 disk drives with keyboard or joystick (analog or switch type). All functions support color or Hi-Res operation, as well as 4 screen display modes.

GRAPHICOM/VIDEO DIGITIZER $199.95

Input directly into Graphicom for easy enhancements, manipulation, stamping, and storage. Catalog all your favorite "video photos" of your friends, family, movie & TV characters on diskette.

Accepts composite video signal in (1.0v p-p) from video camera, VCR, video disc player, another computer, or other compatible video sources.

View "off air" or "VCR" digitized video at close to real-time. "Snapshot" video frames to the digitizer's internal memory. No slow, "blurry" serial manipulation . . . just hit your joystick's fire button! It's that simple.

Use with your multi-pak or a "Y" cable ("Y" cable available at $19.95)

Video is input via a "BNC" connector. External controls for HORIZONTAL POSITION, VERTICAL POSITION, HORIZONTAL WIDTH, BRIGHTNESS, and CONTRAST (FUZZ) settings.

Don't be fooled by imitations...this is the GRAPHICOM VIDEO DIGITIZER . . . the **only** digitizer that "DIRECTLY" inputs into Graphicom (The original design by Cheshire Cat, the folks that brought Graphicom to the COCO world).

REQUIRES 64K COCO, 1 DISK DRIVE, AND 2 ANALOG JOYSTICKS. FREE GRAPHICOM PROGRAM, PICTURE DISK, AND GRAPHICOM UTILITY SUPPLIED WITH PURCHASE OF VIDEO DIGITIZER (A $50 VALUE).

HOLIDAY SPECIAL $49.95
- GRAPHICOM
- G.C.U.
- GRAPHICOM PART II

a $70 value!

PICTURE DISKS $9.95

Available from COMPUTIZE

4C	Artifact color palette
5C	Large character sets drawn with master design (from Derringer Software)
6C	Same as 5C but set up as stamp set
7	Miscellaneous Art Set #1
8	Miscellaneous Art Set #2
9	Miscellaneous Ads and Examples
10	Miscellaneous Fonts
11C	Artifact color palette type fonts
12C	Art demo from WHITESMITH
13C	GRAPHICOM PART II function demo

Computize INC.

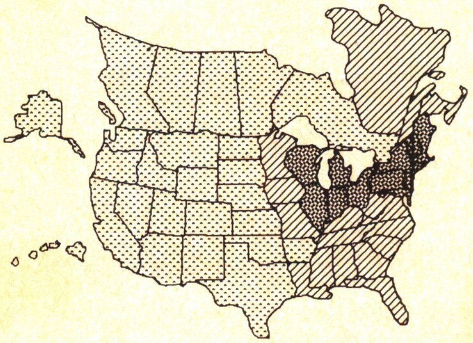
(215) 946-7260 P.O. BOX 207 • LANGHORNE, PA 19047

VISA MasterCard

ADVERTISER'S INDEX

We encourage you to patronize our advertisers — all of whom support the TRS-80 Color and TDP System-100 computers. We will appreciate your mentioning THE RAINBOW when you contact these firms.

AAA Chicago Computer Center 281
Alban Scientific 264
Ankia Research 7
Ark Royal Games 173
Aurora Software 246
B & B Software 212
B5 Software 23
Basic Technology 233
Betasoft Systems 8
Bercom enr. 114
Big B Software 226
Bluegrass Software 39
Botek Instruments 251
Butterfly Software 194
Calc-Soft 142
Cer-Comp 85
Challenger Software 200
Cinsoft 220
Classical Computing 232
CMD 222
CNR Engineering 236
CoCo Warehouse 40
Cognitec 13
Cognitive Development 232
Color Connection Software 153
Color Micro Journal 93
Color Power Unlimited, Inc. 9
Color Software Services 119
Colorware 145, 146, 147
Compugenesis 237
Compugram 206
CompuServe 63
Computer Accessories of Arizona 120
Computer Associates 122
Computer Island 94, 95
The Computer Mom 71
Computer Plus 3, 189
Computer Systems Center 199
Computerware . . . . . 140, 141, BC
Computize, Inc. 239, 304
Cosmos Computer Services Inc. 266
Creative Technical 285
Custom Computer Products 10
Custom Software Engineering 125
CY-BURNET-ICS 69
The Data'Phile 238
Data-Comp 279
Datafact Software LTD 214
Dataman International 79, 121, 167, 248
Dayton Associates of W. R. Hall, Inc. 184
Deft Systems 17
Delker Electronics 49
Derringer Software 123, 182, 183, 208
Derby City Software 21
Dorison House Publishers Inc. 16
Dorsett 11, 92
Double Density Software 82, 83
Dragon User 204
DSL Computer Products 159
DSS Pheripherals Corporation 197
Dugger's Growing Systems 14
E.D.C. Industries 240
EAP Co. 300
Eclectic Systems Corporation 148
Elite Software 191, 192, 193
Endicott Software 98
Federal Hill Software 135, 137
Four Star Software 247
GIMIX 306
Grafx 280
Grantham Software Division 58, 59
Great Plains Computer Co., Inc. 296
Green Mountain Micro 106
Hawkes Research Services 261
HJL div. of Touchstone Technology, Inc. 81
Frank Hogg Laboratory . . . . . IBC
Howard Medical 34, 250
Incentive Software 102
Intracolor 215
J & M Systems 177
JARB Software 89, 283
The JBM Group Inc. 287
D.P. Johnson, ... 292
Kelly Software Distributors 151
Key Color Software 134
KRT Software 227
LP Seymour SVS 221
Mark Data Products 104, 105, 165
Metric Industries 244, 259
MichTron 33, 35
Micro Magic 218
The Micro Works 243
Microcom Software 31
Microtech Consultants Inc. 301
Microware Systems Corporation 284
Tom Mix Software . . . . . IFC, 139, 169, 170, 171
Moreton Bay 207, 209
Multi Venture 222, 225
NOVASOFT 126
Oelrich Publications 214
The Other Guys Software 143
Owls Nest Software 56
Owl-Ware 260
Ozone Engineering 70
Parsons Software 196
PBJ, Inc. 87, 293
PD Software 208
Perry Computers 205
Petrocci Freelance Associates 149
Picosoft Games 22
Pinto Products 103
PoCo Graphics 261
Polygon Co. 223
Dr. Preble's Programs 276
PXE Computing 15
R.G.S Micro Inc. 229, 231
Radio Shack 186, 187
The Rainbow Bookshelf 160
Rainbow Gift Certificate 51
RAINBOWfest 298, 299
Ram Publications 70
Real-Time Specialties, Inc. 101
REM Industries 86
Robotic MicroSystems 223
Sadare Software 29
Saguaro Software 270
Sancher Enterprize 116
Selected Software 210
Skyline Marketing 53, 55
The Soft Shop 246
SOFTECH 228
Softlaw Corp. 25, 26, 27
Softmart 100
Software Connection 242
The Software House 206
Software Plus 161
Software Support, Inc. 290, 291
Solid Software 166
Southwestern Digital 201
Spectral Associates 109, 111, 113, 115, 117
Spectrum Projects 129
Speech Systems 74, 75, 76, 77
Sugar Software 45, 234, 235
T & D Software 122
Tandar Software 168
TCE Programs, Inc. 54, 202
Titan Software 289
TMP Software 65
Tri-Tech Electronics 262
Triad Pictures 255
True Data Products 273, 275
Vidtron 41
Wasatchware 198
West Bay 203
Wish Software 236
Woodstown Electronics 57
Workbase Data Systems 230
YGS 176
York 10 263
Zoso Software 213

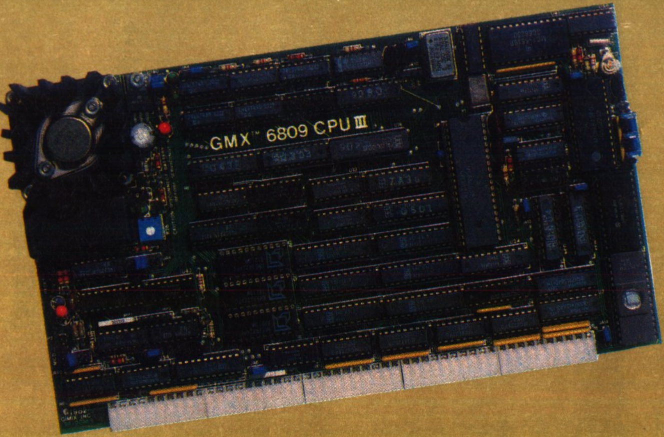


▩ **Call:**
Jack Garland
Garland Associates, Inc.
P.O. Box 186 S.H.S.
Duxbury, MA 02331
(617) 934-6546

░ **Call:**
Cindy Shackleford
Director, West Coast Office
12110 Meridian South — Suite 8
P.O. Box 73-578
Puyallup, WA 98373-0578
(206) 848-7766

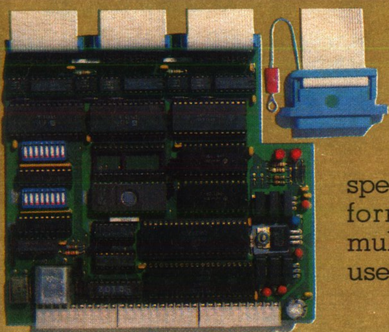
▨ **Call:**
Kate Tucci
Advertising Representative
9529 U.S. Highway 42
P.O. Box 385
Prospect, KY 40059
(502) 228-4492

GIMIX STATE OF THE ART 6809 SYSTEMS FOR THE SERIOUS USER.



GIMIX has 19MB or high performance 47MB Winchester Drive Systems and/or Floppy Disk Drive Systems.

For the ultimate in performance, the Unique GMX 6809 CPUIII, using either OS-9-GMXIII or UniFLEX GMXIII (available shortly), gives protection to the system and other users from crashes caused by defective user programs. e.g. During program development, a programmer who crashes goes back to the shell or the debugger, while the other users are not even aware anything occurred.



The intelligent serial I/O processor boards significantly reduce system overhead by handling routine I/O functions, thereby freeing up the host CPU for running user programs. This speeds up system performance and allows multiple terminals to be used at 19.2K baud.

For the user who appreciates the need for a bus structured system using STATIC RAM and powered by a ferro resonant constant voltage transformer.

GIMIX has single user systems that can run both FLEX and OS-9 or Multi user systems for use with UniFLEX or OS-9.

GIMIX versions of OS9 and UniFLEX include maintenance and support by Microware (90 days) and TSC (1 year). Maintenance and support after this period are available at extra cost.

(NOTE: this support and maintenance is only for use with approved GIMIX hardware)

GIMIX 6809 systems support five predominant operating systems:

OS-9 GMX III,
OS-9 GMX II,
UniFLEX,
OS-9 GMX I,
FLEX

and a wide variety of languages and development software.

Whatever your application: software development, instrumentation, process control, educational, scientific or business; whether you need single or multi-user capabilities, GIMIX has hardware and the operating systems to get the job done reliably.

Please phone or write if you need further information.

BASIC-09 and OS-9 are trademarks of Microware Systems Corp. and MOTOROLA, Inc.
FLEX and UniFLEX are trademarks of Technical Systems Consultants, Inc.
GIMIX, GHOST, GMX, CLASSY CHASSIS, are trademarks of GIMIX, Inc.

GIMIX inc.

1337 WEST 37th PLACE • CHICAGO, ILLINOIS 60609 • (312) 927-5510 • TWX 910-221-4055

©1983 GIMIX Inc.

CHRISTMAS SHOPPING LIST

F=Flex O=OS-9 R=Radio Shack

NEW	NOMAD The Personal Robot for CoCo complete with software.	250.00	

WORD PROCESSING

	DynaStar OR DynaForm	49.95	FO
	DynaStar AND DynaForm	99.90	FO
	DynaSpell, the best spelling checker	59.95	FO
	DynaSpell w/Lookup for RS OS-9	94.90	O
NEW	Dyna-Pak (DS/DF and Word-Pak)	199.95	FO
	Stylograph	99.95	FO
	Stylo-Pak (Stylo and Word-Pak)	199.95	FO
	TSC Text Processor for Flex	75.00	F

LANGUAGES

TSC X-BASIC for Flex	100.00	F
TSC Pascal for Flex	200.00	F
Basic09 for RS OS-9	99.95	O
C-Compiler for RS OS-9	99.95	O
Crunch Cobol for Flex	100.00	F
Windrush PL/9	198.00	F
A/BASIC compiler	75.00	FO
Dyna-C compiler	59.95	FO
eFORTH (The best FORTH)	79.95	FR
DynaSoft Pascal (P code compiler)	59.95	FO
Introl C full compiler	425.00	F

SPREADSHEET and DATABASE

	Dynacalc for CC Flex	200.00	F
NEW	Dynacalc for RS Dos	99.95	R
	RMS Database for CC Flex	200.00	F
	RMS for Radio Shack OS-9	250.00	O
	InfoMag Database	99.95	F

SYSTEM SOFTWARE

SPEC	Color Computer Flex	49.95	F
SPEC	ED/ASM for Flex	49.95	F
SPEC	Flex with ED/ASM	69.95	F
	DBASIC with CC Flex	30.00	F
	Radio Shack OS-9	69.95	O
	O-Pak Hi-Res and copy for RS OS-9	34.95	O
	SDisk for RS OS-9	29.95	O
	SDisk w/BootFix for RS OS-9	35.95	O

UTILITIES and PROGRAMMING TOOLS

NEW	CModem Terminal program	50.00	FO
NEW	Color Connection II	49.95	FO
NEW	Color Connection II for RS DOS	39.95	R
	Color Utilities for CC Flex	50.00	F
	Disk Utility Program	50.00	F
	Super Sleuth disassembler	50.00	FO
	Super Sleuth for RS DOS	49.00	R
	Dynamite + for Flex	100.00	F
	Dynamite + for RS OS-9	59.95	O
	Toolkit #1 (for XBasic)	49.95	F
	TS Edit for Flex (same as RS OS9)	34.95	F
	Utilix for RS OS-9	49.95	O
NEW	UniCharger for RS OS-9	150.00	O
NEW	Textools for RS OS-9	29.95	O
	File Handler's Toolbox RS OS-9	85.00	O
	Filter Kit #1 for RS OS-9	29.95	O
NEW	Filter Kit #2 for RS OS-9	29.95	O
	Hacker's Kit #1 for RS OS-9	24.95	O

UTILITIES and PROGRAMMING TOOLS cont.

TSC Debug for Flex	75.00	F
TSC Diagnostics for Flex	75.00	F
TSC Extended Precompiler for Flex	50.00	F
TSC Flex Utilities for Flex	75.00	F
TSC Sort Merge for Flex	75.00	F
TSC 68000 Cross Assembler Flex	250.00	F
Windrush MACE editor/assembler	98.00	F
Esther (AI for Flex)	39.95	F
6502 Translator for Flex	75.00	F
6502 Translator for RS OS-9	85.00	O
MACROS for Flex	50.00	F
MACROS for RS OS-9	55.00	O
MACROS / ALL for Flex	100.00	F
MACROS / ALL for RS OS-9	110.00	O
PIC/PID for Flex	50.00	F
PIC/PID for RS OS-9	75.00	O
6805 Debugging Simulator / Flex	75.00	F
6805 Debugging Simulator/RS OS-9	100.00	O
6502 Debugging Simulator / Flex	75.00	F
6502 Debugging Simulator/RS OS-9	100.00	O

HARDWARE

	Video + for CoCo	24.95	
	Video + II M for CoCo	26.95	
	Video + II C for CoCo	39.95	
	PBJ Word-Pak (NEW low price)	119.95	
NEW	PBJ Word-Pak II (80X24 and smooth)	149.95	
	P-C Pak w/Printer Port & Clock	132.70	
	Y-Cable for WordPac	29.95	
NEW	OS-9 Driver for Word-PaK	19.95	O
	Flex Driver for Word-PaK	19.95	F
	OS-9 Driver for PC Pac	24.95	O
	8-64K Dynamic RAM Chips	45.00	
*	Drive 0, ½ Height SSDD 40T	353.00	
*	Drive 0, ½ Height DSDD 40T	374.00	
*	Drive 0, ½ Height DSDD 80T	391.00	
*	Drive 1, SSDD 40T ½ Hgt. Drive	223.00	
*	Drive 1, DSDD 40T ½ Hgt. Drive	244.00	
*	Drive 1, DSDD 80T ½ Hgt. Drive	261.00	
	Bare SSDD 40T ½ Height Drive	160.00	
	Bare DSDD 40T ½ Height Drive	195.00	
	Bare DSDD 80T ½ Height Drive	250.00	
*	½ Height Dual 5¼" CASE W/PS	79.95	
	J & M Disk Controller	139.95	
NEW	DSS Disk Controller JDos or RS DOS	139.95	
	HJL Keyboard for CoCo	79.95	

* case holds TWO ½ height drives

Books and other stuff

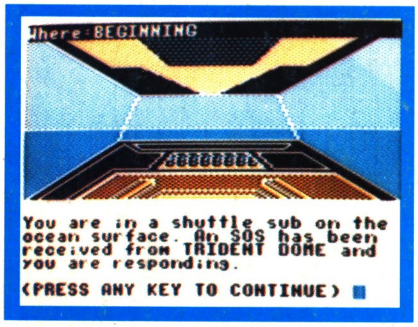
	Starter Kit for Compuserve	39.95	
	Basic09 Tour Guide Book	18.95	O
NEW	Relocating Macro Assembler Manual	25.00	O
	Starting Forth	18.95	

VISA, M/C, AMEX, Diners accepted
Call for Christmas delivery

FHL FRANK HOGG LABORATORY

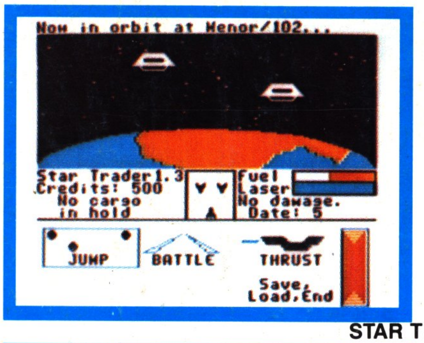
THE REGENCY TOWER • SUITE 215 • 770 JAMES ST. • SYRACUSE, NY 13203
PHONE (315)474-7856 • TELEX 646740

STRATEGYADVENTUREFUN

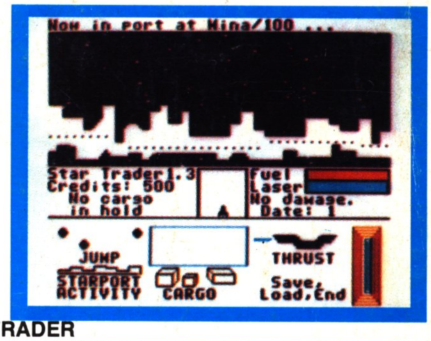

Where:BEGINNING

You are in a shuttle sub on the ocean surface. An SOS has been received from TRIDENT DOME and you are responding.

(PRESS ANY KEY TO CONTINUE)

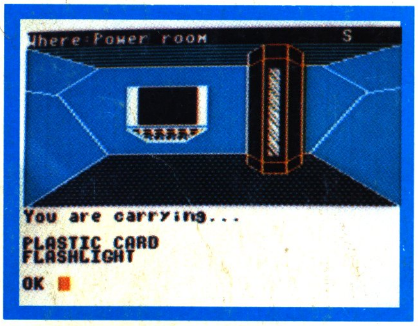

Now in orbit at Menor/102...

Star Trader 1.3
Credits: 500
No cargo in hold
Fuel
Laser
No damage.
Date: 5


Now in port at Nina/100 ...

Star Trader 1.3
Credits: 500
No cargo in hold
Fuel
Laser
No damage.
Date: 1

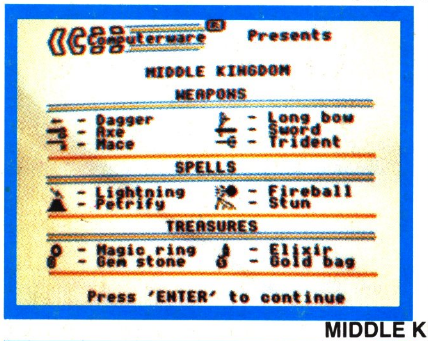
STAR TRADER


Where:Power room S

You are carrying...

PLASTIC CARD
FLASHLIGHT

OK


Computerware® Presents

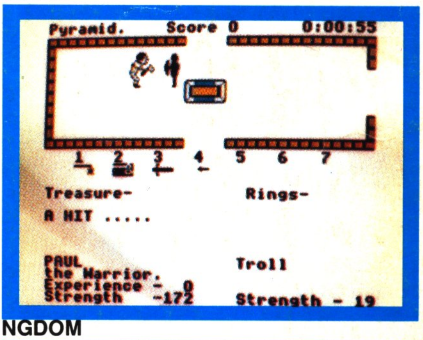
MIDDLE KINGDOM

WEAPONS
- Dagger - Long bow
- Axe - Sword
- Mace - Trident

SPELLS
- Lightning - Fireball
- Petrify - Stun

TREASURES
- Magic ring - Elixir
- Gem stone - Gold bag

Press 'ENTER' to continue


Pyramid. Score 0 0:00:55

1 2 3 4 5 6 7

Treasure- Rings-

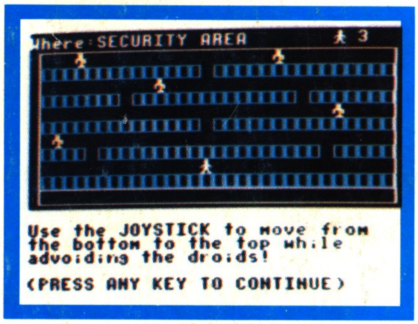
A HIT .....

PAUL
the Warrior.
Experience - 0
Strength -172

Troll

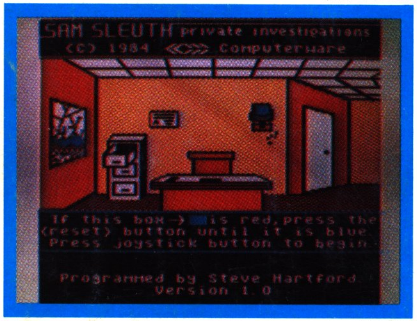
Strength - 19

MIDDLE KINGDOM


Where:SECURITY AREA 3

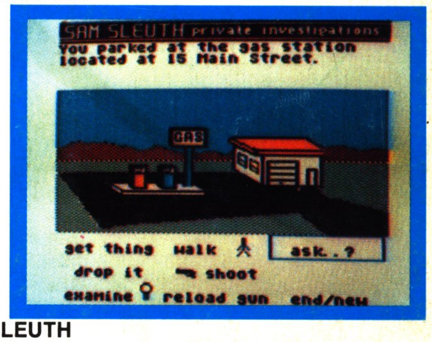
Use the JOYSTICK to move from the bottom to the top while avoiding the droids!

(PRESS ANY KEY TO CONTINUE)


SAM SLEUTH private investigations
(C) 1984 Computerware

If this box -> is red, press the (reset) button until it is blue.
Press joystick button to begin.

Programmed by Steve Hartford
Version 1.0


SAM SLEUTH private investigations

You parked at the gas station located at 15 Main Street.

MAJOR ISTAR

SAM SLEUTH

MAJOR ISTAR

Under the Doomed Sea

The *ultimate* adventure! The *biggest* and most *complex* adventure ever! ★ 104 rooms ★ 3 arcade games ★ 118 words ★ 33 objects. Save & Load feature for disk or tape. Can you be the hero? In 3 months, 6 months, a year. . . ?

SCENARIO: You travel to TRIDENT RESEARCH DOME because an urgent call for help is received from one of the service droids stationed there. He said help was urgently needed, but before he could say why, his transmission was cut off!

OBJECT: Solve the mystery at TRIDENT in as few moves as possible.

SETTING: In the beginning of the 21st century, undersea cities, interstellar spaceships, colonies in other planets & solar systems, worker droids, super computers, are all realities. One hero of the time is MAJOR ISTAR. In the late 1990's when space exploration & colonies began, it was necessary to form a task force to offer help to all that needed it in these hostile environments. You, Camerion J. Istar, are a highly rated member of that team and you have never failed to solve a mystery! (Requires 32K & joystick)

cass $24.95 disk $27.95

MIDDLE KINGDOM

In this real-time graphic adventure, your goal is to become ruler of the Middle Kingdom, which can be achieved only be returning the three magic Rings to the Sanctuary. You must search the rooms of the Catacombs, Temple, & Pyramid.

You choose your character of a Magician, Merchant, or Warrior, each having their own weapons & abilities. You will face monsters of all types, Lizardmen, Trolls, Goblins, & worse. You'll find treasures of all kinds too, as well as new weapons along the way!

Try this medieval adventure if you dare! (Requires 32K)

cass $24.95 disk $27.95

STAR TRADER

As a merchant ship captain in the far future, you travel in real-time between solar systems, trading cargo, encountering pirate ships, stopping at starports for fuel or repairs, & making money! Your goal is to earn 1,000 credits to retire in luxury!

Your graphic cockpit shows readouts of your location, damage status, credit balance, cargo destination & due date, the location of nearby starships, fuel & laser power levels, & the current date. With your joystick, you choose your next move or transaction. As you travel, transport, trade, & battle, you develop a reputation which affects your future activities & rewards.

With different skill levels & many variable factors, this simulation offers excitement & the challenge of a new game every time you play! (Requires 32K on cassette or 64K on disk, with one joystick or mouse, & Ext. Basic)

cass $24.95 disk $27.95

SAM SLEUTH

As the detective Sam Sleuth, you are given 3 cases (of increasing difficulty):

Case of the Missing Cat
Mystery at the Museum
Baffling Bank Robbery

Using your sleuth skills (& joystick or mouse), you search the town (displayed in hi-res graphics), interviewing townspeople, collecting evidence, examining the grounds, & gathering data to solve the mysteries & apprehend the culprits. The games change every time you play, so you will want to play again and again!

Investigate the bank, museum, school, offices & homes, market, gas station, . . . Talk to Mike, Willy, Roy, Sue, Chrissy, . . . And keep track of those addresses & clues!

The unique graphics presentation & mouse/joystick control are as intriguing as the mysteries! (Requires 64K & mouse or joystick)

cass $24.95 disk $27.95

COMPUTERWARE®

P.O. BOX 668 • ENCINITAS, CA 92024 • (619) 436-3512

Computerware® is a federally registered trademark of Computerware®